

Proposal# 2001- K220 (Office Use Only)

**PS P Cover Sheet** (Attach to the front of each proposal)

Proposal Title: Reintroduction of Native Salmonids in Central Valley Headwaters: Bioengineering Requirements and Social Acceptability

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Amount of funding requested: **\$296,786**

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost \_\_\_\_\_

Federal cost \_\_\_\_\_

Cost share partners?

Yes ☒ No

Identify partners **and amount** contributed by each We plan to apply to the Four Pumps program and to the National Fish and Wildlife Foundation for additional funding.

Indicate the Topic for which you are applying (check only **one box**).

- |  |   |
|--|---|
| <input type="checkbox"/> Natural Flow Regimes                | <input type="checkbox"/> <del>Beyond the</del> Riparian Corridor                |
| <input type="checkbox"/> Nonnative Invasive Species          | <input type="checkbox"/> Local Watershed Stewardship                            |
| <input type="checkbox"/> Channel Dynamics/Sediment Transport | <input type="checkbox"/> Environmental Education                                |
| <input type="checkbox"/> Flood Management                    | <input type="checkbox"/> Special Status Species Surveys and Studies             |
| <input type="checkbox"/> Shallow Water Tidal/ Marsh Habitat  | <input checked="" type="checkbox"/> Fishery Monitoring, Assessment and Research |
| <input type="checkbox"/> Contaminants                        | <input type="checkbox"/> Fish Screens   |

What county or counties is the project located in? Alpine, Amador, Butte, Calaveras, El Dorado, Fresno, Glenn, Lake, Madera, Mariposa, Placer, Sacramento, San Joaquin, Shasta, Sierra, Siskiyou, Solano, Stanislaus, Sutter, Tehama, Yolo, Yuba

What **CALFED** ecozone is the project located in? See attached list and indicate number. Be as specific as possible 4, 6.1, 8.1, 8.2, 9.1, 11.2, 11.3, 12.3, 12.4, 13.1, 13.2, 13.3

Indicate the type of applicant (check only one box):

- |  |  |
|--|--|
| <input type="checkbox"/> State agency                    | <input type="checkbox"/> Federal agency        |
| <input type="checkbox"/> Public/Non-Profit joint venture | <input checked="" type="checkbox"/> Non-Profit |
| <input type="checkbox"/> Local government/district       | <input type="checkbox"/> Tribes                |
| <input type="checkbox"/> University                      | <input type="checkbox"/> Private Party         |
| <input type="checkbox"/> Other: _____                    |  |

**Indicate the primary species which the proposal addresses (check all that apply):**

- |  |   |
|--|---|
| <input type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon |   |
| <input checked="" type="checkbox"/> Winter-run chinook salmon                                | <input checked="" type="checkbox"/> Spring-run chinook salmon |
| <input type="checkbox"/> Late-fall run chinook salmon  | <input type="checkbox"/> Fall-run chinook salmon              |
| <input type="checkbox"/> Delta smelt   | <input type="checkbox"/> Longfin smelt                        |
| <input type="checkbox"/> Splittail   | <input checked="" type="checkbox"/> Steelhead trout           |
| <input type="checkbox"/> Green sturgeon  | <input type="checkbox"/> Striped bass                         |
| <input type="checkbox"/> White Sturgeon  | <input type="checkbox"/> All chinook species                  |
| <input type="checkbox"/> Waterfowl and Shorebirds  | <input type="checkbox"/> All anadromous salmonids             |
| <input type="checkbox"/> Migratory birds   | <input type="checkbox"/> American shad                        |
| <input type="checkbox"/> Other listed T/E species: _____                                     |   |

**Indicate the type of project (check only one box):**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Research/Monitoring | <input type="checkbox"/> Watershed Planning |
| <input type="checkbox"/> Pilot/Demo Project             | <input type="checkbox"/> Education          |
| <input type="checkbox"/> Full-scale Implementation      |   |

Is this a next-phase of an ongoing project? Yes \_\_\_\_\_ No ☒  
Have you received funding from CALFED before? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, list project title and CALFED number \_\_\_\_\_

Have you received funding from CVPIA before? Yes \_\_\_\_\_ No ☒

If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):  
\_\_\_\_\_

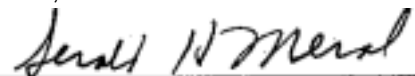
By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and

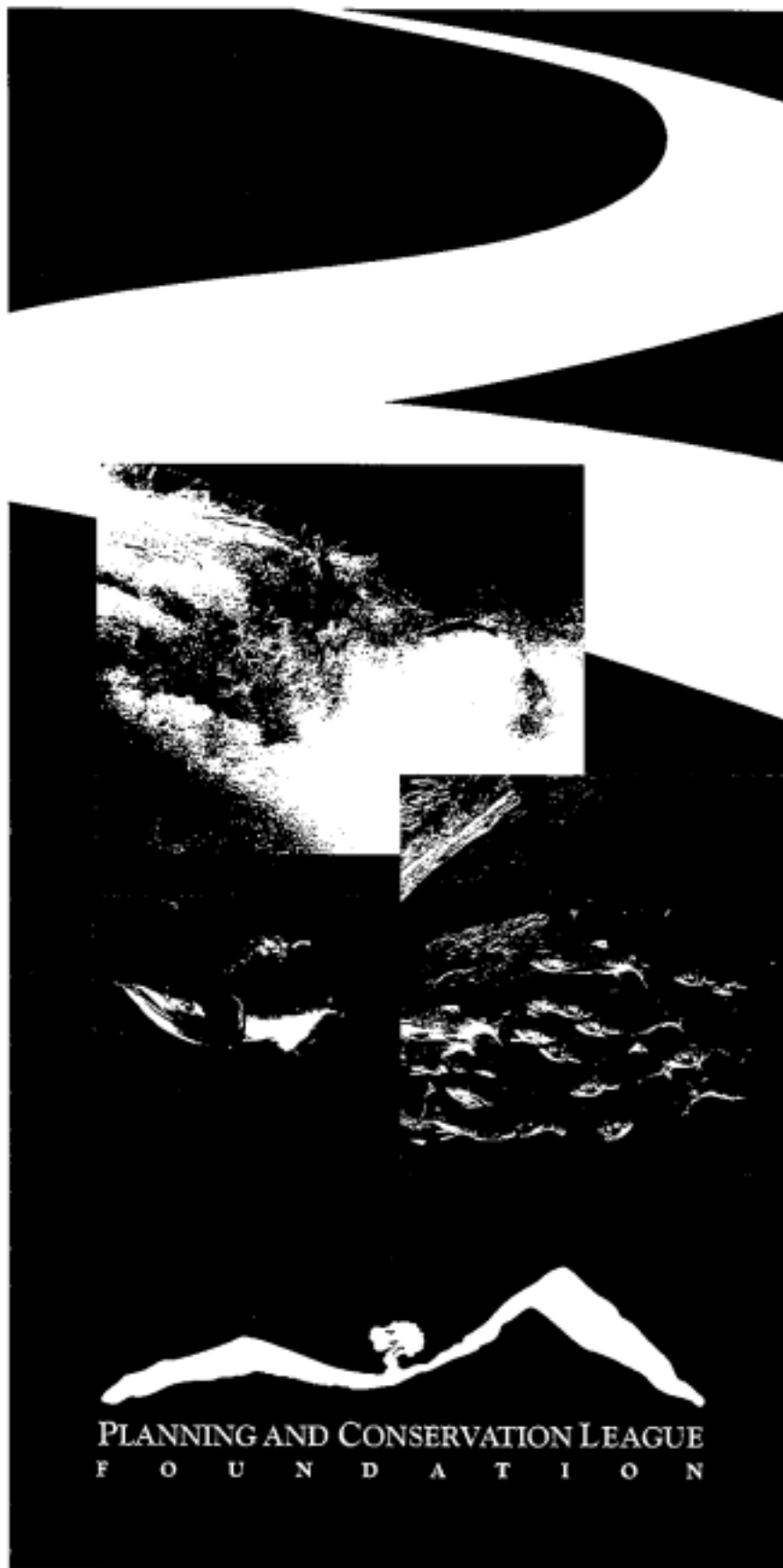
The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Gerald H. Meral, Ph. D, Executive Director

Printed name of  
applicant,



Signature of applicant



**Proposal to  
CALFED  
Bay-Delta Program**

**Reintroduction of  
Native Salmonids  
in Central Valley  
Headwaters:  
Bioengineering  
Requirements and  
Social Acceptability**

submitted by:

**The Planning and  
Conservation League  
Foundation**

in association with

**Harza Engineering  
Company, Inc.**

May 2000

## B. EXECUTIVE SUMMARY

Project Title: Reintroduction of Native Salmonids Into Central Valley Headwaters:  
Bioengineering Requirements and Social Acceptability

Amount

Requested: **\$296,786** over **two** years

Applicant: The Planning and Conservation League Foundation  
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The construction of dams along the Central Valley's rim long ago blocked steelhead and spring run salmon from reaching their historic spawning habitat in the headwaters where the gravels and cool water they require are available. Central Valley steelhead trout have been listed as threatened under the Federal Endangered Species Act and spring run chinook salmon have been proposed for listing as endangered under the Federal Endangered Species Act and are listed as threatened under the California Endangered Species Act. This endangered species status has been disruptive to local, state, and federal water projects because extraordinary efforts must be made to avoid diverting downstream migrants into irrigation diversions and the Delta pumps, and extra flows will have to be released to attract upstream migrants to the few remaining spawning areas. If these species could be sufficiently restored to allow de-listing, the extraordinary steps that must be taken could be avoided, preventing a major loss of water supply.

While alteration of river temperature downstream of the major dams and removing dams on small tributary creeks can help somewhat in restoring steelhead and spring run salmon populations, only a remnant of these populations can ever be expected to spawn in the available habitat. As the next step in recovery, serious consideration needs to be given to providing passage around the valley's major rim dams to permit restoration of these species in headwater habitats. This project proposes to undertake a series of systematic analyses that will create the comprehensive knowledge base required to provide the context for making decisions about restoration in headwaters areas. The analyses will consist of a three-stage process. First, previous studies of upstream fish passage around valley rim dams will be documented, and an assessment will be made of experience with provision of fish passage around major dams in the Pacific Northwest. Second, a screening level analysis of 11 rivers with rim dams will be conducted to identify their relative promise for headwaters reintroduction. Third, based on the screening analysis, three dams will be selected where the potentials, options, costs, benefits, tradeoffs for steelhead and spring run salmon can be examined in closer detail, permitting a decision to be made about whether it would be productive to undertake a pilot headwaters reintroduction project, and if so, what river and what approach to passage would be most likely to offer the best opportunities to create a positive impact on the recovery of the wild populations of the two species.

## C. PROJECT DESCRIPTION

### 1. Statement of the Problem

#### a. Problem

One of the most intractable problems regarding anadromous fish restoration in the Central Valley is the unavailability of suitable habitat below the “valley rim” dams for steelhead and spring run salmon. These fish require cool water in the summer, and gravels typically found at high elevation for spawning.

The major dams such as Shasta, Oroville, Folsom, New Melones, Bullard’s Bar, and Friant, long ago blocked steelhead and spring run salmon from reaching their spawning habitat. Citing studies by Reynolds et al. 1993 and Yoshiyama et al. 1996, the analysis of steelhead trout issues presented in CALFED’s Ecosystem Restoration Program Plan (1999, pp. 224-225) concludes that “The single, most limiting factor for the decline of Central Valley steelhead is elimination of access to an estimated 82% to 95% of historical spawning and rearing habitat.” The analysis of chinook salmon issues in the Ecosystem Restoration Program Plan notes that spring run chinook were once the dominant salmon run in the Sacramento and San Joaquin Rivers, but that unfortunately, they spawned primarily in stream reaches that are now above the major dams (p. 218). It further notes that now that this habitat is no longer available, wild populations of spring run chinook no longer exist in the San Joaquin basin and are only present in a few of the smaller tributaries of the Sacramento River.

Because of the significant reductions in the wild populations of these species, Central Valley steelhead trout have been listed as threatened under the Federal Endangered Species Act and spring run chinook salmon have been proposed for listing as endangered under the Federal Endangered Species Act and are listed as threatened under the California Endangered Species Act. The CALFED Ecosystem Program Plan (1999) places both species in Priority Group I, and for both, establishes a goal of “recovery”, which is defined as arresting or reversing the decline of the species and neutralizing threats, assuring its long-term survival in nature.

While alteration of river temperature downstream of the major dams can help somewhat in restoring steelhead and spring run salmon populations, nothing more than a remnant of these populations can ever be expected to spawn on the Valley floor. Removal of small dams on the creeks tributary to the Sacramento River can help, but these creeks can only support minor amounts of spawning.

In the Pacific Northwest, similar problems are addressed by moving adult fish upstream of the dams, and capturing the downstream migrants before they enter the reservoirs, or at least before they pass through the dams.

To date, efforts to evaluate opportunities to move fish upstream of the Central Valley’s major rim dams have been limited. Perhaps the most significant of these studies is the

Upper Yuba River Studies Program, which is now underway. This program, which evolved out of an initiative to remove the Englebright Dam, is now examining the options for removal or modification of the dam for the purpose of permitting passage of steelhead and spring run salmon up into their historic habitats along the Yuba's Middle and South Forks. The project's studies have been scoped, and will be implemented over the next year or so. The project is expected to be completed in late 2001, when determination will be made of whether it is biologically, environmentally, and socio-economically feasible to introduce wild chinook salmon and steelhead to the upper Yuba watershed. This study will make a valuable contribution to the knowledge about habitat conditions on the Middle and South Forks of the Yuba and will provide an improved understanding of the technical issues and tradeoffs related to the removal or modification of Englebright Dam. However, the study's limitation is that it is an analysis of just a single dam and watershed that may be different in some important ways from other watersheds in the Central Valley river system. Because the study is looking at only one dam and watershed, there is no larger frame of reference against which the costs and benefits of restoration on this particular river can be compared. Given the inescapable fact that providing fish passage around large dams is very expensive, the salient public policy questions are: Why this dam and this watershed? Does provision of fish passage around this dam into this watershed provide the best return for the money spent and the tradeoffs sustained? How do we know that there isn't another watershed where there is a better payoff for the money and fewer tradeoffs with other resource values?

This proposal suggests implementation of an integrated set of analyses that will help to provide answers to these questions. It will develop an overview of the potentials for restoring salmon and steelhead to the historic habitat areas behind all the Central Valley's large rim dams that will allow the most promising headwater restoration opportunities to be identified and prioritized in terms of potential costs, benefits, tradeoffs, and political feasibility. When completed, these analyses will help provide a defensible basis for making decisions about further uses of restoration funds to achieve restoration and recovery of Central Valley steelhead and spring run salmon populations. One use of the data and insights generated will be to provide a sense of the feasibility, costs, and benefits of headwater restoration that can be used in weighing the allocation of resources between headwater and downstream restoration measures. For example, the results of the analyses may suggest that expenditure of a large amount of money to restore passage to a headwaters area with a large and well protected area of habitat might have more of a positive effect on restoring populations of the fish species of interest than investment in a large number of less expensive projects in downstream areas whose value to the species may be more marginal. In addition, should it appear that restoration of passage to historic headwater habitat areas is viable and is required to meet species restoration objectives, the results of these studies will help to determine whether the Middle and South Forks of the Yuba, or perhaps some other watershed or watersheds, would represent the best option or options for development of specific fish passage and salmon and steelhead reintroduction plans.

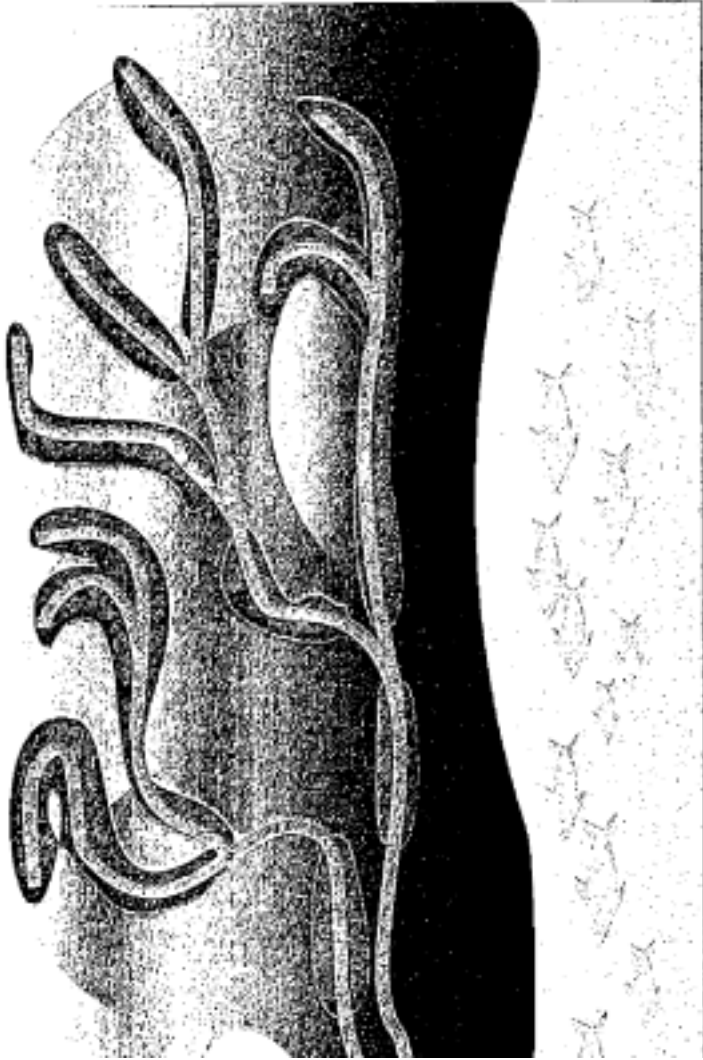
## b. Conceptual Model

For the purposes of the proposed study, a conceptual model has been developed that focuses on just one element of the system of interest, the loss of upstream habitat, which the literature suggests has been the most important factor leading to declines in wild stocks of Central Valley steelhead and spring run salmon. However, it is also true that other factors have contributed to the decline of these species. For example, water diversions have changed flow regimes, causing a loss of natural migration cues and raising water temperatures above the range consistent with the needs of juvenile fish. Downstream diversions have interrupted or blocked the free passage of adults and juveniles. Unscreened or poorly screened diversions entrain fish as they are migrating. Channelization, levee construction, and land use changes have led to loss and degradation of the woody debris, shaded riverine riparian corridors and forests, and floodplain functions and habitats. These other factors are an important piece of the restoration picture, but to some degree they are already being addressed by previously approved downstream projects funded by the CALFED Environmental Restoration Program. In addition, these lower reach variables will be the focus of systematic evaluation and recommendations for action measures developed by CALFED's Fish Passage Improvement Program, which concerns itself with the portions of the Bay-Delta watershed located below the major rim dams. The proposed study has been defined to complement these on-going lower watershed restoration analyses and actions by focusing on the historic habitat in the headwater areas.

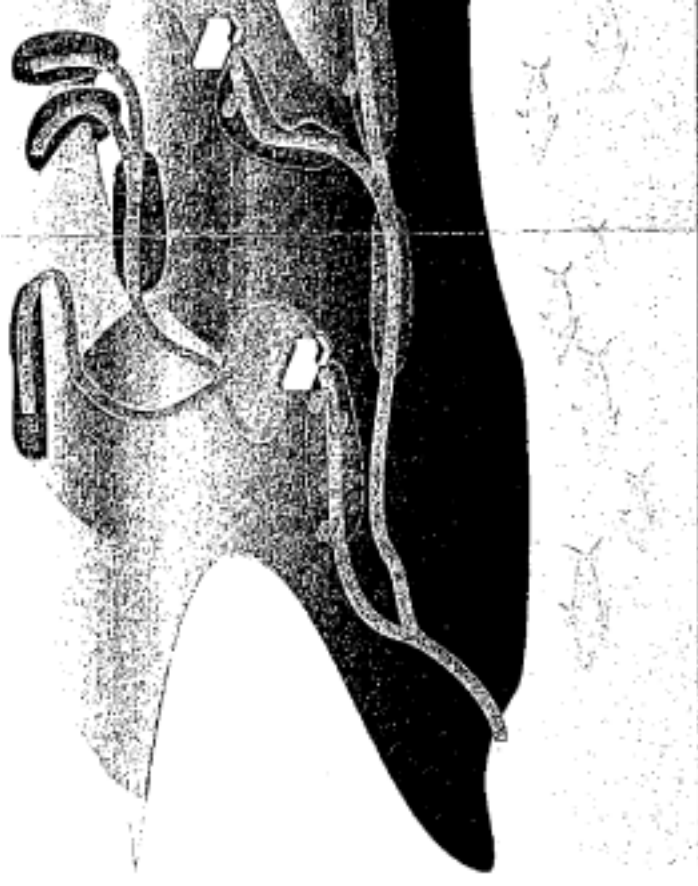
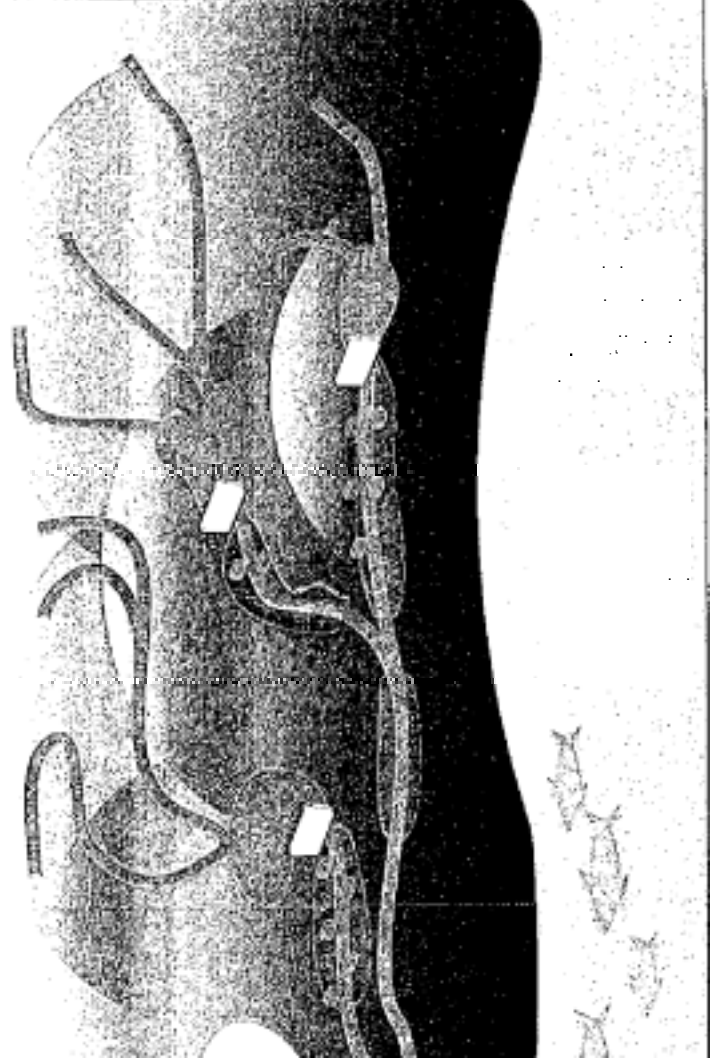
Figure 1 presents a conceptual model that highlights the cause and effect relationships that provide the backdrop for the proposed work. The diagrams are conceptual only, and are not intended to be a literal diagram of the Sacramento/San Joaquin river system. The ecosystem reality the model's first panel highlights is that historically, the prime spawning and rearing habitat for steelhead and spring run salmon in the Sacramento/San Joaquin river system was the habitat located in the upper watersheds, and when this habitat was available, the basin supported a large and healthy population of these two species. The second panel graphically communicates that after construction of the major valley rim dams, the prime upriver habitat on the major streams was no longer accessible for spawning and rearing, leaving only small areas of habitat on smaller tributaries and in downstream areas, leading to significant reductions in the populations of the two species, even with supplementation of the population by means of hatcheries. The third panel illustrates that by providing for fish passage around the large dams, much of the historic headwater habitat can become available again, and as a result the overall populations of steelhead and spring run salmon can be increased. The fourth panel illustrates the completion of the restoration process, with the numbers of wild steelhead and salmon increasing to the extent that hatcheries become less necessary to maintain the desired population levels.

## c. Hypotheses

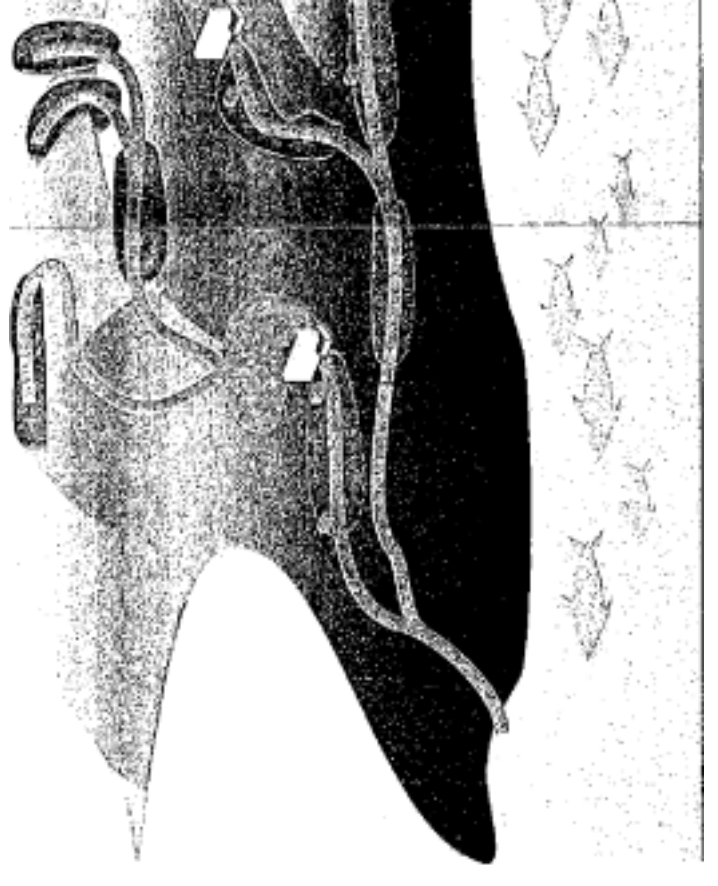
Figure 2 presents the proposed study's hypotheses and the data required to test them.



Valley Rim Dams



4. After reestablishment of habitat above the Valley Rim Dams





## Figure 2. – Hypotheses

### Hypothesis/Data Required for Testing

- 1.) Significant amounts of high quality habitat that meet the special spawning and rearing needs of steelhead and spring **run** salmon is available upstream of the major rim dams **on** the Sacramento/San Joaquin river system. **Information** required:

For each river's upstream reaches, data on surface area of spawning beds, number and size of holding pools, extent and quality of riparian habitat, dams and other barriers in the upstream reaches, existing flow regimes (including water quantity, quality, and temperature).

- 2.) The habitat available upstream of the major rim dams is particularly valuable because much of it is located on lands managed by the **US** Forest Service, the Bureau **of** Land Management, and the National Park Service which now provide or have the potential to provide strong protections of habitat values. Information required:

For each river's upstream reaches, data on areas of habitat that **fall** within lands managed by the Bureau of Land Management, US Forest Service and US Park Service. This data should be stratified to indicate the amounts of habitat subject to policies providing low, medium, and high levels of protection.

- 3.) It is feasible to implement engineered solutions that will successfully permit steelhead and salmon adults and juveniles to pass around major rim dams **on** the Sacramento/San Joaquin river system. Information required:

Evaluations of fish passage solutions that have been implemented in other regions, identifying their relative degree of success in providing for adult and juvenile passage around major dams, and any lessons from this experience that would inform implementation of fish passage measures on the Sacramento/San Joaquin river system. Data from a sampling of rivers **on** the Sacramento/San Joaquin system that identifies the technical options for providing passage around major rim dams, factors likely to contribute to or detract from their ability to provide for successful passage, relative costs, tradeoffs with other resource values, and political feasibility.

- 4.) Reintroduction of steelhead and salmon into the areas upstream of the major rim dams has the potential to make a significant contribution to the restoration of healthy, self-sustaining populations of these species. Information required:

Evaluations of the experience in other regions where fish passage has been provided around large dams to assess the role that these measures have played in restoring and sustaining wild populations of steelhead and salmon. Assessment of the change in overall population of wild steelhead and spring run salmon in the Sacramento/San Joaquin system that would be achieved by providing fish passage at a sampling of rim dams. This assessment needs to take into account the amount and quality of the habitat that would be opened up and the relative effectiveness of specific passage measures in providing successful upstream and downstream fish passage.

- 5.) It is feasible to conduct a systematic analysis and planning process that will lead to identification of a river where it will be feasible and cost-effective to undertake a pilot project to reintroduce steelhead **and/or** spring run salmon into the habitat upstream of a major rim dam. Information required:

Implementation of an analysis and planning process like the one specified in this proposal, and at the end of the process, systematic review to determine its effectiveness in achieving its objectives.

All five of the hypotheses address CALFED ERP Strategic Goal 1 – At-Risk Species, which includes a provision that calls for the recovery of at-risk native species and the establishment of large, self-sustaining populations in the “watershed above the estuary” as well as in the Delta, Suisun Bay, and San Francisco Bay. Steelhead and spring run salmon are both at-risk species whose status has the potential to affect the operations of the State Water Project and Central Valley Project diversions in the south Delta. Because restoration of these species in headwater areas above the rim dams is likely to be a key factor in assuring their recovery, and because only limited assessment of the potentials for this restoration has been conducted to date, the knowledge gained through testing of the hypotheses presented in Figure 2 is vital for achievement of this goal.

#### d. Adaptive Management

The conceptual model described in Section C.1.b. and diagrammed in Figure 1 is consistent with the adaptive management design presented in Chapter 3 of the PSP and diagrammed in PSP figure 2.

The problem that the conceptual model is concerned with is the diminished population of Central Valley steelhead and spring run salmon. The ecosystem goals/objectives are to bring about a significant increase in the self-sustaining population of these species, and the model supports the achievement of this goal by identifying a critical element of the system that can potentially be modified to bring about sustainable population increases.

The model reflects the insights gained through the monitoring and research activities of the past several decades. It also, and very importantly, provides a framework for integrating the insights that will be developed through the proposed research and analysis project and through the pilot upstream restoration project it is intended to lead to. The program of research and analysis proposed is explicitly related to the Healey ladder principles incorporated into Section 4 of the model. In conformance with these principles, the approach taken will be information rich. It will bring together much of the existing information and analysis related to steelhead and spring run salmon restoration issues in the target watersheds and will summarize it in a form that is structured by the conceptual model and that is relevant to the objective of evaluating the feasibility of restoration above the rim dams. In addition to synthesizing the existing knowledge, the project will conduct targeted research that will generate information intended to supplement what is already known. This research will complement the research and analyses related to the river reaches below the rim dams being undertaken by CALFED's Fish Passage Improvement Program. The objective is to create a more complete knowledge base that will provide the context within which opportunities for upstream steelhead and salmon restoration can be identified and evaluated, leading to a well-informed decision about whether upstream restoration is likely to be justified, and if so, to identify the location and nature of a pilot upstream restoration project that would produce the most information and best results. If, based on the results of the proposed study, the decision is made to proceed with a pilot upriver restoration project, the pilot

project then would serve as a real-world test of the feasibility and effectiveness of headwaters restoration as a means to bring about the desired increases in self-sustaining steelhead and spring run salmon populations.

#### e. Educational Objectives

The primary focus of this project is research and analysis rather than education. However, the project will contribute to the education of agency staff, members of stakeholder groups, and the general public through its development of summary reports that will synthesize both existing and new information and make it useful for comprehensive and systematic evaluation of the options for restoration in the headwaters above valley rim dams. The project's reports will be distributed directly to CALFED staff and to the agencies and organizations represented on the Advisory Committee. In addition, the project reports will be posted on the Planning and Conservation League Foundation's website where they will be accessible to all. Should a broader education program related to upstream restoration issues be desired in the future, this project's products would provide a good point of departure for development of the program's content.

## 2. Proposed Scope of Work

### a. Project Location/Geographic Boundaries

This project is concerned with and will focus on the portions of the upper reaches of the Sacramento and San Joaquin Rivers and their tributaries that lie behind large rim dams that constitute major barriers to fish passage. Figure 3 indicates the rivers of interest, the barrier dams which define the upper reaches that the study will evaluate, the names of the CALFED Ecological Zones to which the upper watersheds are adjacent or proximate or with which they overlap, and the names of the counties in which these upper reaches are located. All of the study reaches fall within the Bay-Delta watershed, but for the most part, the areas they encompass do not fall within the Bay-Delta Ecological Zones. However, for the reasons explained in Section C.1.a, the environmental restoration opportunities available in these areas have the potential to make a substantial contribution to the achievement of CALFED's and the CVPIAs environmental restoration goals.

The study rivers and reaches were defined in consultation with the Director of CALFED's Fish Passage Improvement Program and are intended to include only those upstream portions of the Sacramento and San Joaquin rivers and their major tributaries that are not already being evaluated as a part of the Fish Passage Improvement Program.<sup>1</sup> In addition, the study area has been defined to exclude the area that is the focus of attention of the Upper Yuba River Studies Program.

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<sup>1</sup> Interview with Ted Frink, Program Manager, CALFED Fish Passage Improvement Program, April 21, 2000

Figure 3. – Rivers Proposed for Study

River	Major Barrier Dam(s) Defining Upper Watersheds	CALFED Ecological Zones to Which Upper Watersheds are Adjacent or Proximate or With Which They Overlap	Upper Watershed Counties
Sacramento	Keswick, Shasta	4. North Sacramento Valley	Siskiyou, Shasta,
Stony Creek	Black Butte	6.1 Stony Creek	Tehama, Glenn, Colusa, Lake
Feather River	Thermalito, Oroville	8.1 Feather River	Butte, Plumas,
Yuba River, North Fork	New Bullards Bar	8.2 Yuba River	Yuba, Sierra, Nevada
American River	Nimbus, Folsom	9.1 American Basin	Sacramento, El Dorado, Placer,
Mokelumne	Camanche, Pardee	11.2 Mokelumne River	San Joaquin, Calaveras, Amador,
Calaveras	New Hogan	11.3 Calaveras River	Calaveras
Stanislaus	Tulloch, New Melones	13.1 Stanislaus River	Calaveras, Tuolumne, Alpine
Tuolumne	La Grange, Don Pedro	13.2 Tuolumne River	Tuolumne
Merced	New Exchequer	13.3 Merced River	Mariposa, Madera
San Joaquin	Mendota Pool, Friant Dam	12.3 Mendota Pool to Gravelly Ford 12.4 Gravelly Ford to Friant Dam	Fresno, Madera

In addition to taking a focused look at the upper reaches of these rivers, the project will also include more generalized consideration of conditions on the portions of these rivers lying between the barrier dam/s and the Delta and open ocean. In developing its assessments of downstream conditions and their implications for the species of interest, this project will rely heavily on data and assessments developed by other programs, particularly CALFED's Fish Passage Improvement Program and the Upper Yuba River Studies Program.

Figures 4a & b are maps indicating the generalized locations of the 11 watersheds that will be included in the initial screening study.<sup>2</sup>

#### b. Approach

This project's general approach will be to conduct a screening level analysis of the 11 rivers to determine the relative potential for reintroducing steelhead and spring run salmon into their upper watersheds, and based on that analysis, to select three rivers where the potentials, options, costs, benefits, and tradeoffs for reintroduction can be examined in closer detail. At the end of this analysis process, the findings will be presented in a form that will permit the options for introducing one or both species back into watersheds above major dams to be compared to other options for assuring healthy, self-sustaining populations of these species in the Bay-Delta system. In addition, the watersheds with the best potential for reintroduction of the two species will be identified. If the options for reintroducing the two species in upper river reaches appear to be attractive when compared to other alternatives, this study would provide the foundation for subsequent planning, design, and implementation of a pilot upper watershed fish passage development and anadromous species reintroduction program. The tasks involved in conducting these analyses, the products and outcomes resulting from them, the data that would be drawn upon, and the analysis approaches that would be applied are summarized in the table presented as Figure 5.

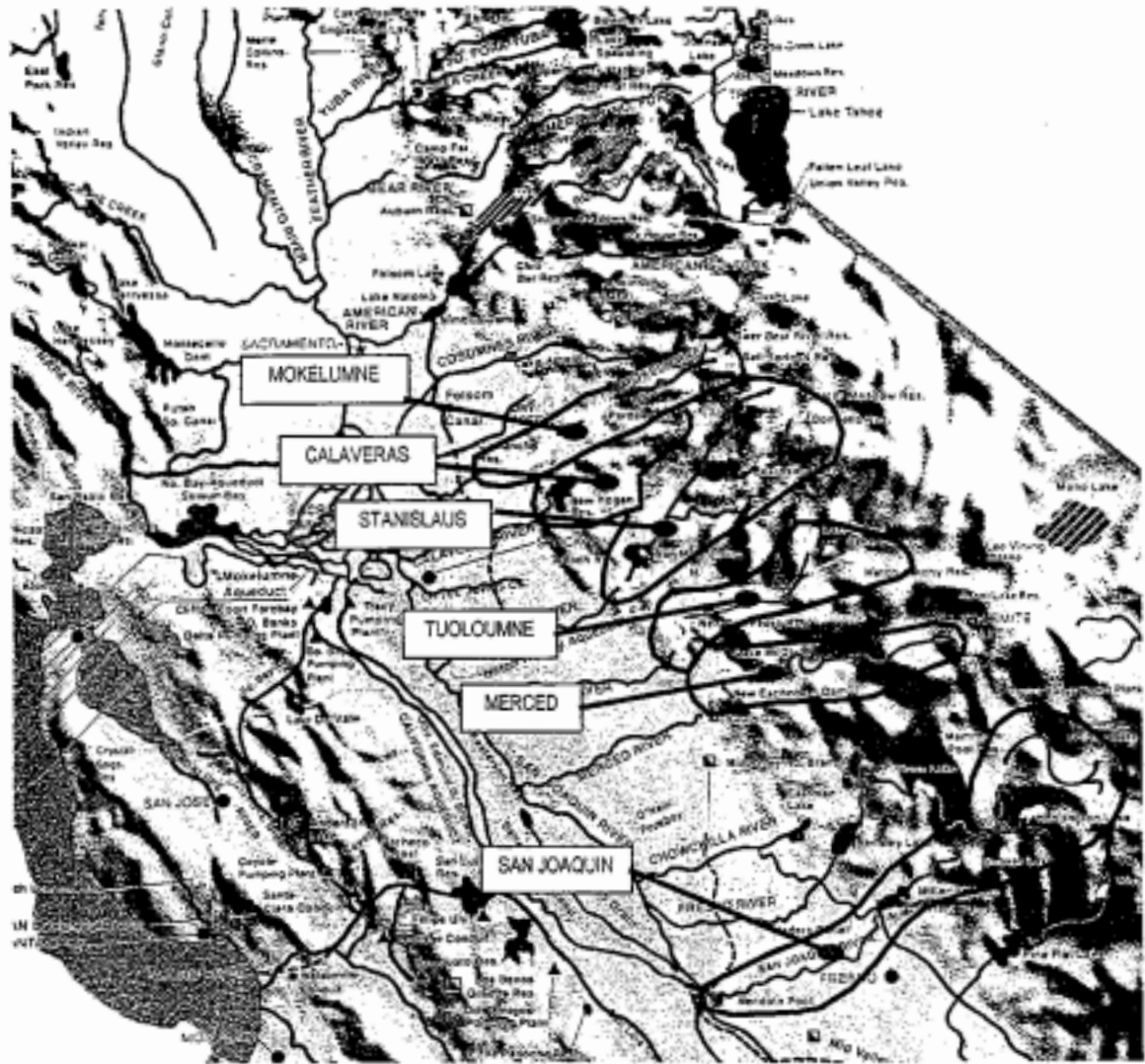
All project analyses will be conducted with the guidance and review of a project Advisory Committee. This committee will be composed of representatives of CALFED, regulatory and resource management agencies, water agencies, utilities, water users, local governments, and fishing, recreation and conservation groups. The Advisory Committee will play a central role in initial scoping of issues, structuring of analyses, identification of potential information sources, development of operational criteria for hypothesis testing, review of analyses and report drafts, and review and provision of feedback on final study conclusions.

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<sup>2</sup> Because of the large size of the watersheds that will be included in the study, and their geographic range, it was not practical to include maps at a scale of 1:24,000, 1:100,000 or 1:250,000 with this proposal. During the watershed screening phase and at the time of the analysis of the three watersheds selected for more intensive study, more detailed maps will be prepared. At the time, the three dams and watersheds are selected for intensive study, appropriate utm data and geographic coordinates that can be entered into a geographic information system can be provided.

FIGURE 4.2





Base Map from California Water Map, Water Education Foundation

Rivers for Proposed Study  
- San Joaquin Valley Watersheds -

FIGURE 4.b

Figure 5. -Tasks , Schedule, and Products/Outcomes

Task No.	Description	Schedule	Products/Outcomes	Data and Methods
1	Project Initiation			
1a	Prepare project background materials	Month 1	Brief summary of project objectives, approach, and relationship to the larger Bay-Delta process for use in project correspondence and posting to PCLF web site	Base on objectives and work plan stated in the proposal.
1b	Establish Advisory Committee	Month 1	Project Advisory Committee established and members provided with project summary piece (1a), schedule, and letter summarizing role they are being asked to play	Build on the PCLF's extensive experience in collaborating with agencies, stakeholders, and local and state-wide advocacy groups.
1c	Prepare report maps	Months 1 - 2	Overview map of Sacramento/San Joaquin Basin showing the river system and identifying the 11 river reaches being evaluated. Page-size maps of upper reaches of the rivers being analyzed, indicating the boundaries of their upper watersheds, the location of the major barrier dams, and the boundaries of counties, National Forests, BLM lands, wilderness areas, and National Parks	Build on existing mapping available from the USGS and land and resource management agencies and customize for the needs of this project.
1d	Identify, review, & evaluate past Sacramento/San Joaquin basin rim dam fish passage studies	Months 1 - 2	Brief report providing summary and assessment of past studies of rim dam fish passage studies in the Sacramento/San Joaquin basin	Based on interviews and review of documents and technical reports.
1e	Document, review, and evaluate experience to date on the Upper Yuba River Studies Program	Months 1 - 2	Brief report providing summary and assessment of experience to date on the Upper Yuba River Studies program, highlighting similarities and differences between that study and this one, and implications for this study's approach	Base on interviews and review of documents and technical reports.



1f	Document, review, and evaluate experience with provision of fish passage around large dams in the Pacific Northwest	Months 1-2	Succinct report providing summary and assessment of experience in providing fish passage around large dams in the Pacific Northwest, identifying lessons learned and implications for fish restoration behind rim dams in the Sacramento/San Joaquin basin	Base on interviews, review of documents and technical reports, and on Harza's 40 years of fish passage engineering experience, including its current experience on the Cowlitz River.
1g	Inventory, collect, and assess the available data related to the 11 rivers being evaluated	Months 1-2	<p>Assembly of a comprehensive collection of data and studies useful for assessing the 11 rivers in terms of habitat and fish population conditions and barriers to fish passage</p> <p>Development of a list and brief characterization of the data that is available.</p>	Review data bases that have been assembled by resource and land management agencies and by other groups. Data bases to be consulted will include the California Rivers Assessment (CARA) data base at UC Davis and DFG's California Natural Diversity data base. A review will also be made of technical and peer-reviewed articles and of reports by personnel from the DFG, DWR, and other agencies. An inventory and review will also be made of readily available air photo coverage.
1h	Initial meeting with Advisory Committee	Month 3	<p>Feedback on the drafts of the reports produced by tasks 1d, 1e, 1f.</p> <p>Identification and operationalization of the criteria to be used to evaluate the 11 watersheds</p> <p>Review of the information sources known to be available and identification of additional information sources useful for the initial watershed screening process</p>	Apply PCLF's extensive experience in planning consultation committee meetings and structuring them to produce useful results.
1i	Revise background reports based on feedback from Advisory Committee	Month 3	<p>Final drafts the reports produced by tasks 1d, 1e, 1f.</p> <p>Posting of reports on PCLF web site</p>	Apply PCLF's and Harza's extensive experience in preparing reports that are well written and illustrated and which present findings in a readily understandable way.

2	Watershed Screening			
2a	<p>Conduct screening analyses based on summarization and evaluation of readily available data and assessments of opportunities, constraints, and costs for providing fish passage around the barrier dams defining the upper watersheds.</p>	<p>Months 3 – 6</p>	<p>Draft of a summary report containing a matrix and brief profiles of conditions in each river basin providing a first-cut assessment of the relative suitability for reintroduction of steelhead and salmon in each of the upper Watersheds. Report will present quantitative and qualitative summary measures related to:</p> <ul style="list-style-type: none"> <li>• Characteristics of the major dam(s) blocking passage to the upper watershed and identification of constraints they pose for construction of fish passage facilities.</li> <li>• Extent, character and quality of upstream habitat</li> <li>• Upstream barriers, diversions, and flows</li> <li>• Degree to which upstream watershed is protected by US Park Service, USFS, wilderness, or wild and scenic river status</li> <li>• Potential productivity of upstream watershed</li> <li>• Nature of the existing upstream fishery and constraints posed for reintroduction of anadromous fish. Hatchery issues.</li> <li>• Reservoir transit issues</li> <li>• Whether or not there is a hatchery at the base of the major barrier dam</li> <li>• Number and status of downstream barriers, and likelihood that they will be removed or that fish passage will be restored</li> <li>• Downstream flow, water quality and habitat conditions</li> <li>• Political resistance/support</li> </ul> <p>The report will include an identification of the three river basins that appear to have the best potential for reintroduction of the two species into the upper watershed.</p>	<p>The analysis will make use of the data and insights provided by the studies generated by tasks 1d, 1e, and 1f; will draw on the data collected and reviewed in task 1g; and will be informed by the insights provided by the Advisory Committee.</p> <p>Evaluation of habitat and fish population conditions will be based on assessment of existing data and air photos.</p> <p>Constraints posed by dams for implementation of fish passage measures will be assessed qualitatively by Harza fish passage engineering specialists.</p> <p>Assessment of downstream fish passage and habitat conditions will be developed based on consultation with CalFed Fish Passage Improvement Program.</p> <p>Assessment of political feasibility and resource tradeoffs will be based on interviews with land and resource management agency staff, stakeholders, and representatives of watershed councils.</p> <p>To rank river basins in terms of relative suitability for restoration of anadromous species above the rim dams, the US Army Corps of Engineers Water Resources Assessment Methodology (WRAM) will be applied.</p>

2b.	Present results of screening analysis to Advisory Committee	Month 7	<p>Review comments on final report.</p> <p>Confirmation of the three watersheds to be subjected to more in-depth analysis</p> <p>Identification of issues requiring special consideration in the in-depth analyses</p> <p>Identification of important stakeholders and key informants in the three watersheds</p>	Apply PCLF's extensive experience in planning consultation committee meetings and structuring them to produce useful results.
2c	Prepare and disseminate the final draft of the watershed screening report	Month 7	<p>Final draft of the report</p> <p>Distribution of report to agencies and stakeholders identified by the Advisory Committee and CALFED</p> <p>Posting of report on PCLF website</p>	Apply PCLF's and Harza's extensive experience in preparing reports that are well written and illustrated and which present findings in a readily understandable way.
3	<b>In-Depth Analysis of the Upper Watersheds of Three Rivers</b>			
3a	Collect and assess existing sources of detailed data available for the three watersheds	Months 7 – 8	<p>Assembly of a collection of the in-depth data and studies useful for assessing the 3 rivers in terms of habitat and fish population conditions, barriers to fish passage, and lower watershed habitat conditions</p>	Detailed review of relevant data collected in tasks 1 and 2. Review of data available in GIS data bases maintained by land and resource management agencies
3b	Interviews with stakeholders and key informants in each of the three watersheds	Months 7 – 10	<p>Completed interviews with major stakeholders and key informants in each of the three watersheds</p> <p>Summary reports for each watershed identifying:</p> <ul style="list-style-type: none"> <li>• Issues or concerns in the watershed requiring special treatment in the analysis, including competing resource concerns</li> <li>• Local knowledge about historic and present fish population and habitat conditions</li> <li>• Additional sources of available information</li> <li>• Potential support for or opposition to restoration in the watershed</li> </ul>	Apply PCLF's extensive experience in conducting interviews with agencies, stakeholders, and members of watershed councils to assess resource management and policy issues.

3c	Review results of stakeholder interviews/develop final study designs for each river basin	Month 10	Final Study design	Apply PCLF and Harza experience in assessing interview data and developing study designs.
3d	Conduct upstream habitat assessments and prepare GIS maps	Months 10 - 13	Mapped and statistical analyses of the extent and character of potential habitat in the upstream watershed. Factors considered will include number and nature of upstream barriers and diversions, flow regime, water temperature and quality, watershed land uses, and watershed land management policies.	Analysis of existing studies and data, supplemented by insights gained through contacts with agency biologists, further GIS mapping, interpretation of air photos, and application of the professional experience of the project scientists.
3e	Assess upstream fish population issues and any hatchery-related issues	Months 10 - 13	Assessment of existing upstream fish population issues providing opportunities or constraints for reintroduction of steelhead and spring run salmon. Assessment of any hatchery-related issues.	Analysis of existing studies and data, supplemented by insights gained through contacts with agency biologists, and application of the professional experience of the project scientists.
3f	Assess downstream issues/ constraints to fish passage	Months 10-13	Assessment of downstream barrier, habitat, and flow issues, highlighting opportunities or constraints they pose for providing access to or from the watershed's upstream reaches	Consultation with CalFed Fish Passage Improvement Program; use of available maps, inventories, and studies; and application of the professional experience of the project scientists and the insights gained from the agency and stakeholder interviews.
3g	Assess fish passage options	Months 12 - 14	Assessment of fish passage options, including trap and haul systems and fish ladders. The assessments will include conceptual diagrams, order of magnitude estimates of cost, and evaluations of the advantages and disadvantages of each approach	Field visits and review of available topographic maps, engineering drawings and other data by Harza fish passage engineering specialists and development of preliminary engineering evaluations
3h	Assess reservoir migration issues	Months 12-14	Assessment of reservoir migration issues and identification and evaluation of structural and management options for addressing them	Analysis of site conditions and application of insights, from research literature and past professional experience.

3i	Assess the relative productivity of the upper watershed habitat that would be opened up by provision of passage around each dam	Months 14-15	For each dam, an assessment of the potential productivity of the habitat that would be opened up under alternative fish passage alternatives	Analysis of watershed habitat conditions, conditions affecting fish passage options and potential degree of success, and application of insights from research literature and past professional experience.
3j	Assess tradeoffs	Months 14-15	For each dam and for each alternative, an assessment of the tradeoffs with other environmental and resource values that would be entailed	Assessment of other established uses on the river and in the watershed, review of applicable land management plans and policies, and interviews with land management agencies and stakeholders.
3k	Assess potential funding sources	Month 15	An assessment of the potential funding sources for each of the alternatives identified	Application of PCLF's experience with the programs and funding sources, and its understanding of priorities and political forces to identify those sources that would be most realistically available for projects of the type identified.
3l	Assess political feasibility	Month 15	An assessment of the political feasibility of each of the options identified for each watershed	Apply PCLF's extensive experience in conducting interviews with agencies, stakeholders, and local and state-wide advocacy groups to assess resource management and policy issues.
4	Final Report and Recommendation	Month 15	Final Report and Recommendation	Final Report and Recommendation
4a	Prepare draft report	Months 15 - 16	Prepare draft report summarizing the findings of the studies conducted in the upper watersheds of the three rivers, with additional reference to any findings available from the Upper Yuba River Studies Program.  Circulate report to Advisory Committee members for review	Apply PCLF's and Harza's experience synthesizing complex material to produce reports which present findings in a readily understandable way.

4b	Meet with Advisory Committee	Month 17	<p>Feedback on final report</p> <p>Confirmation of any options for fish passage restoration identified as being feasible and cost-effective</p> <p>If warranted by the study findings, identification of a specific project in one of the three watersheds studied that would be a candidate for near-term implementation</p> <p>Feedback on the strengths and Weaknesses of the process followed and evaluations conducted as a part of this project. Recommendations for modifications to the process and to the analytic approaches should similar studies be conducted in other Watersheds or for other issues.</p>	Apply PCLF's experience in planning consultation committee meetings and structuring and managing them in a way that produces useful results.
4c	Meet with Calfed planning staff	Month 17	<p>Confirmation of any options for fish passage restoration identified as being feasible and cost-effective. If warranted by the study findings, identification of a specific project in one or more of the watersheds that would be a candidate for implementation.</p> <p>Feedback on the strengths and weaknesses of the process followed and evaluations conducted as a part of this project. Recommendations for modifications to the process and to the analytic approaches should similar studies be conducted in other watersheds or for other issues.</p>	Apply PCLF's experience in planning meetings and structuring them in a way that produces useful results.
4d	Revise Final Report and Disseminate	Month 18	<p>Final Report Draft</p> <p>Dissemination of final report to CALFED, Project Advisory Committee, Federal and State Agencies, local governments, water users, non-governmental organizations, and interested individuals</p> <p>Posting of report on PCL website</p>	Apply PCLF's and Harza's experience in preparing reports that are well written and illustrated and which present findings in a readily understandable way.
5	Project Mgmt.	Months 1-18	<p>Good internal/external communication</p> <p>Timely completion of products that fulfill study objectives</p>	Apply PCLF's and Harza's experience in managing large research and planning studies.

### c. Monitoring and Assessment Plans

This project is a research and planning project rather than an implementation project. **As** a consequence, although it may have a longer-term effect on increasing populations of the species of interest, it will not have immediate effects on habitats and species populations that can be monitored and measured. However, it will be appropriate to establish measures to monitor, document, and evaluate the overall process design and the specific analyses that are conducted as a part of it. This is important because the protocols and analysis approaches developed as a part of this project will have the potential to serve as models for further analyses of the possibilities for reintroduction of anadromous fish above other dams in the Bay-Delta drainage system or elsewhere in California. Documentation and evaluation of the process and its analyses will provide a basis for institutional learning in that what was done will be clearly recorded, and an identification will be made of the lessons learned that can be applied in the design of future studies. The primary means to achieve this documentation and assessment will be retrospective activities at the end of the project that will entail preparation of a draft report that summarizes the overall process followed. It will also describe each of the process steps and analyses conducted and any difficulties encountered in implementing them. This draft report will be used as the basis for structured discussions at the final meetings with the project Advisory Committee and CALFED staff. In these discussions, each process step and analysis will be evaluated in terms of its perceived strengths and weaknesses, the factors contributing to the strengths and weaknesses, its relative contribution to the overall process, a rating of its cost/effectiveness, and the changes that would make it more effective if it were to be used in future planning processes. The evaluations and insights gained from these discussions will be integrated into a project retrospective assessment that will be included as an appendix to the final report.

### d. Data Handling and Storage

The research, analyses, and assessments produced by this study will be documented through preparation of the written reports specified in Figure 5. These reports will be distributed to members of the project Advisory Committee and CALFED, and will be made available to the public by means of posting on the Planning and Conservation League Foundation's web site.

At the time that the assessments of the three rivers selected for in-depth study takes place, Harza's geographic information systems unit will create GIS maps of each river's headwaters and its habitat conditions that will be used as a basis for many of the analyses. If there should be an interest in having this data be made publicly accessible, PCLF would be willing to make it available to CALFED for posting on an appropriate web site.

### e. and f. Expected Products/Outcomes and Work Schedule

Figure 5 summarizes the individual tasks involved in carrying out the project, the products and outcomes that will be produced, and the time allocated for their execution

and completion. Should it not be possible to fund the entire project in this funding cycle, tasks 1 and 2, which are inseparable, could be funded as an initial project, and tasks 3 and 4, which also constitute an inseparable unit, could be funded as a follow-up phase. Because task 5, project management, provides support for tasks 1 through 4, provisions for project management would need to be taken into account if tasks 1 and 2 and 3 and 4 were to be funded separately.

Figure 5 serves as a project time line. Because the exact date the project could start is uncertain, the dates are expressed in terms of project month. Figure 6 identifies the major milestones. At each of these milestones, invoices would be submitted.

g. feasibility

The timetable proposed for this project is relatively fast-paced, reflecting the seriousness of the issues associated with steelhead and spring-run salmon and the urgency for finding solutions.

Task 1, which is scheduled for execution in a three month period can be accomplished in this timeframe because it will primarily involve research work conducted in parallel by the various members of the project team, and will, to a large degree, rely on existing sources of information.

Task 2 is scheduled for execution within a four month period. The analysis of the 11 rivers will be based on existing data, most of which will have been collected as a part of task 1. The analyses of the opportunities and constraints for fish passage development will be conducted by Harza's fish passage engineering team which is highly experienced in making this kind of assessment. The efficient assessment of the habitat conditions'and biological variables will be made possible by the involvement of Kenneth Hashagen, who has a long history of experience with Central Valley salmonid issues, and by the involvement of Harza biological staff who have extensive academic training and practical experience related to the study of anadromous fish. The community consultation that will be a part of this process will consist of focused interviews with representative stakeholders and agency staff that will be conducted by the staff of the PCLF, which has previously conducted similar interview-based research in the project area.

Tasks 3 and 4 are scheduled for completion over a 13 month period. In completing these phases of the study, the project team's overall depth of training and experience in executing similar kinds of analyses for other projects will assure timely completion of the work. Because the amount of field work planned is limited, the timing of the project is not likely to be significantly affected by adverse weather conditions or difficulty in getting permissions for access. Should access permits be required for any aspect of the in-depth studies in task 3, access needs and permission for access will be provided to CALFED within 30 days of notice of approval. No permits will be needed to proceed with the tasks.



**Figure 6. –Milestones/Times at Which Invoices Will Be Submitted**

<b>Project Month</b>	<b>Milestone</b>
3	completion of task 1, including the final drafts of the reports associated with tasks 1d, 1e, and 1f
7	completion of task 2, including the final draft of the task 2 report
10	completion of task 3c, final study design
13	completion of tasks 3d, 3e, and 3f, assessments of habitat, fish population issues, and downstream issues
16	completion of task 4a, preparation of draft report
18	completion of task 4d, completion and dissemination of final project report

## D. APPLICABILITY TO CALFED ERP GOALS AND IMPLEMENTATION PLAN AND CVPIA Priorities

### 1. ERP Goals and CVPIA priorities

The proposed project is directly aimed at achievement of CALFED ERP Strategic Goal 1 – At-Risk Species, and the overall goal and a number of the general objectives of the CVPIAs Anadromous Fish Restoration Program.

The CALFED ERP's Strategic Goal 1 includes a provision that calls for the recovery of at-risk native species and the establishment of large, self-sustaining populations in the "watershed above the estuary" as well as in the Delta, Suisun Bay, and San Francisco Bay. The ERP's explanation of this goal specifically identifies steelhead and spring run salmon as 'at-risk species and emphasizes the priority that needs to be given to their restoration because of the potential of their at-risk status to adversely affect the operations of the State Water Project and Central Valley Project diversions in the south Delta (ERP, pp. 22-23).

The overall goal of the CVPIAs Restoration Plan for the Anadromous Fish Restoration Program, as specified in Section 3406(b)(1) of the CVPIA is to "develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable on a long term basis, at levels no less than twice the average levels attained during the period of 1967-1991." At least five of the six general objectives specified for the program would be addressed by the project; these are:

- Improve habitat for all life stages of anadromous fish through provision of suitable quality, quantity, and timing, and improved physical habitat;
- Improve the opportunity for adult fish to reach their spawning habitats in a timely manner;
- Collect fish population, health, and habitat data to facilitate evaluation of restoration actions;
- Integrate habitat restoration efforts with harvest and hatchery management; and
- Involve partners in the implementation and evaluation of restoration actions. (USFWS-1997, p.12)

The project is concerned specifically with steelhead and spring run salmon and with the critical need to make more high quality habitat available for spawning and for the rearing of juveniles. The project will contribute to the achievement of CALFED ERP and CVPIA goals by providing the information needed by policy makers to determine the potential role that opening up historic habitat areas above valley rim dams can play in increasing the populations of these species and to provide the foundation for development of a pilot above-dam restoration project.

### 2. Relationship to other ecosystem restoration projects

The proposed project complements the steelhead and spring run salmon-related restoration and improvement projects that the CALFED ERP and the CVPIA have

sponsored in the Delta, on the lower reaches of the Sacramento and San Joaquin and its major tributaries, and on secondary tributaries like Battle, Butte, and Mill Creeks. In addition, this project will supplement the planning and analysis activities of the CALFED Fish Passage Improvement Program which focuses on the river reaches downstream of the valley rim dams.

3. Requests for Next-Phase Funding  
(not applicable)

4. Previous Recipients of CALFED or CVPIA Funding  
(not applicable)

5. System-Wide ecosystem benefits

The information base developed by this project will provide more clarity on the relative feasibility and potential costs and benefits of restoration in headwaters above rim dams, potentially paving the way for an upstream restoration project. Should such an upstream restoration project be developed, it could have synergistic effects with downstream projects on the same tributary that are oriented to removal of barriers to fish passage; improvements in water flows, temperature, and quality; improvements in streambed conditions and stream corridor habitat; and other measures that improve conditions for steelhead and spring run salmon migration. Opening of additional, and potentially vastly expanded areas of habitat in the headwaters supporting significant increases in the populations of the two species would greatly increase the returns on the investments in downstream improvements.

The listing of steelhead and spring run salmon under the state and federal endangered species acts has been highly disruptive to the water systems of local water districts and the state and federal water projects. These fish move through the rivers at a variety of times, and since they are listed, extraordinary efforts must be made to avoid diverting downstream migrants into irrigation diversions and the Delta pumps, and extra flows will have to be released to attract upstream migrants to the few remaining spawning areas that still exist.

If these species could be sufficiently restored to allow de-listing,, the existing extraordinary steps that must be taken (not to mention future steps which are undoubtedly on the way) could be avoided, and the fish could be treated carefully, but not in a way which necessarily results in a major loss of water supply.

## E. QUALIFICATIONS

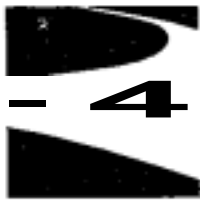
Together, the PCL Foundation and Harza Engineering, constitute a team that has skills in biological assessment, fish passage engineering, and political feasibility analysis. The team's composition and organization are summarized on the accompanying organization chart. Further descriptions of PCLF and Harza, and resumes for the members of the project team are included as appendices.

**PCL Foundation** - The PCL Foundation is a 501 (c)(3) not-for-profit organization founded in 1972. Its mission is to protect California's environment through research, stakeholder outreach, and development of practical solutions to the state's natural resources challenges. PCLF has been a key player in every significant statewide water policy debate since 1983. PCLF is known for its ability to work with diverse stakeholders to fashion workable and broadly-acceptable environmental solutions. Between 1987 and 2000, PCLF organized at least 8 statewide coalitions of diverse interests that backed propositions which resulted in over \$20 billion in conservation funding. PCLF has conducted numerous outreach and research efforts, resulting in more than 40 conservation studies, eight of which focused on watersheds, watershed restoration, and river restoration.

**Gerald H. Meral, Ph.D.**, PCLF Executive Director will serve as manager of the project and will direct the analyses of political constraints and policy implications. From 1975 to 1983, Dr. Meral was Deputy Director of the California Department of Water Resources, where he supervised the Energy and Water Development and Planning Programs, the Office of Water Conservation, and the Delta Planning Program. Dr. Meral served on the predecessor to the Bay-Delta Advisory Committee in 1991 and on the CALFED committee seeking to create new institutional governance mechanisms. In 1994 he played a key role in creating Proposition 204, and for several years, served on CALFED and Prop 204 advisory committees. From 1997 to 2000 he played a leadership role in designing Proposition 13 (water bond act) and educating the public its merits.

**Marc de la Vergne**, PCLF's Associate Director will supervise stakeholder outreach and assume responsibility for stakeholder interviews in selected watersheds. He will also coordinate PCLF's administrative aspects of the project, including grant reporting, contracts with Harza, and publication and distribution of the final report. At PCLF, Mr. de la Vergne directs land use research and grassroots outreach programs and serves as project manager on large research projects.

**Jennifer Palyash**, PCLF's Outreach Coordinator will set up the Advisory Committee and coordinate its efforts, and will assist in identifying and interviewing key stakeholders. Ms. Palyash has worked on a variety of PCL Foundation projects that involve outreach to a broad array of stakeholders. She was involved with the PCL Foundation's Sustainable Sierra project, for which she interviewed and collected comments from businesses, government agencies and organizations which were used in shaping the study's recommendations.



## PROJECT MANAGEMENT AND COORDINATION

Gerald Meral, Ph.D., PCLF, lead  
Thomas Priestley, Ph.D., Harza

### Process Management / Agency and Stakeholder Involvement

Marc de la Vergne, lead  
Jennifer Palyash

### Communications / Reports

Jennifer Palyash, lead  
PCLF staff

### Political Constraints / Policy Issues and Implications Assessments

Gerald Meral, Ph.D., lead  
Marc de la Vergne  
Jennifer Palyash

### Planning Context / Tradeoff Assessments

Thomas Priestley, Ph.D.

### Engineering Assessments

Charles Cutting, P.E., lead  
Dana Postlewait, P.E.  
Daniel Turner, P.E.  
John Pizzimenti, Ph.D.,

### Biological Assessments

John Pizzimenti, Ph.D., lead  
Kenneth Hashagen  
MaryLouise Keefe, Ph.D.  
Steven Statz

### support

Roger Wilson  
Jacqui Blakeley

Reintroduction of Native Salmonids into Central Valley Headwaters:  
Bioengineering Requirements and Social Acceptability

Project Team

**Harza Engineering Company** is an independent engineering firm owned by its employees. Since its founding in 1920, the company has specialized in the development and management of water resources. In the 1950's, the company began to develop expertise in fish hatchery engineering, followed by fish ladder design. Since 1992, Harza scientists and engineers on the West Coast have been working on state of the art fish passage, fish capture, and fish handling projects: Because of this specialized work, Harza has been able to develop a team of highly skilled biological scientists and fish passage engineers.

**Thomas Priestley, Ph.D.**, a Harza Senior Environmental Planner in Harza's Concord, California office will be responsible for coordinating Harza's provision of services to PCLF. He will also play the lead role in assessing relationships between potential restoration plans and other resource uses and values, and will contribute to the writing and editing of reports. Dr. Priestley has broad training as a land use and environmental planner, has experience in conducting and directing research and resource management studies, and has experience in evaluating planning and environmental issues in the Central Valley and Sierra foothills.

**John Pizzimenti, Ph.D.**, a Harza Partner and Managing Scientist will be responsible for directing the biological assessments. Dr. Pizzimenti has extensive experience as the manager of salmon recovery assignments, and he serves as the principal technical advisor to the Bonneville Power Administration on salmon recovery efforts on the Federal' Columbia River power system. In conducting the biological assessments, Dr. Pizzimenti will lead a team of three experienced scientists. **Kenneth Hashagen** is an independent fisheries biologist working under contract with Harza. He will take the lead in assembling and evaluating the available biological data and assessing habitat conditions. Mr. Hashagen has over 30 years of experience with the California Department of Fish and Game where he directed the Natural Diversity Database and the advisory committee that developed a comprehensive statewide salmon and steelhead management plan. **MaryLouise Keefe, Ph.D.**, a Harza Senior Fisheries Scientist and **Steven Statz**, a Harza Fisheries Biologist will assist with the evaluations of habitat conditions and will assess potential habitat productivity. Dr. Keefe's special area of expertise is resident and anadromous salmonids, with an emphasis on life-history, migratory ecology, and hatchery monitoring and evaluation. Mr. Statz has applied a wide range of fisheries and habitat evaluation methods in conducting a large number of project-related studies.

**Charles Cutting, P.E.**, a Harza Fisheries Engineer will be responsible for directing the engineering assessments. In conducting these assessments, he will be assisted by two Harza Civil/Fisheries Engineers, **Dana Postlewait, P.E.**, and **Daniel Turner, P.E.** All three of these engineers have considerable applied experience in the planning and design of fish passage facilities.

**Roger Wilson**, a Harza Hydrogeologist/GIS Analyst will be responsible for the project's GIS maps and data bases. **Jacqui Blakeley**, a Harza Graphic Designer will prepare all project graphics.

## F. COST

### 1. Budget Justification - Total Budget is \$296,786.

Phase I, Project Initiation - Tasks 1a through 1i lay the groundwork for the project. We create the advisory committee; create informational materials describing the project to the public; establish our Advisory Committee; prepare project maps to define our study areas; identify and analyze related studies now underway; document and analyze fish passage programs in other states; identify, collect and assess available data for the 11 study watersheds; meet with the advisory committee; and revise reports created in tasks 1d, e & f, based on Advisory Committee feedback. Total costs for Phase I are \$23,152. Salaries, direct costs and overhead are \$18,346, \$4,285 and \$521. Little travel occurs in this phase, with the bulk of the work consisting of in-office reviews of data. Subcontractor Hashagen provides guidance and assists in data-gathering.

Phase II, Watershed Screening - Tasks 2a through 2c consist of further investigation of the 11 watershed areas with some field investigation, where needed, especially in the political feasibility analysis area. We focus on creating a summary screening report that provides a first-cut assessment of conditions in each river and suitability for reintroduction of salmonids. We narrow the list to three river basins with the reintroduction potential and present the results to the Advisory Committee for comment and revise the screening report. Harza and Hashagen carry out the dam and biological assessments while PCLF conducts the political feasibility analysis. PCLF continues to provide overall coordination of research, report writing, and meetings with Advisory Committee. The Phase II report is posted on the PCLF website. Total costs for Phase II are \$87,351. Salaries, direct costs and overhead are \$64,307, \$19,330 and \$3714, reflecting the more intensive research, writing, travel and communication with stakeholders and each other that are required in this phase. Direct costs for PCLF, Harza and Hashagen in Phase II are primarily travel to some or all the 11 watersheds.

Phase III, In-Depth Analysis of Upper Watersheds of Three Rivers Tasks 3a through 3i consist of detailed investigation of the three most promising rivers identified in Phase II. We collect existing physical, biological and political data on each watershed, conduct detailed interviews with stakeholders and key informants and complete summary reports for each watershed. We review the results of the interviews, create the final study design, and conduct field studies to gather needed data. Total costs for Phase III are \$127,977. The main components of costs in this phase are staff time for analysis and travel to carry out the project's most intensive phase for out-of-office data gathering. Direct costs for PCLF, Harza and Hashagen in Phase III are almost entirely travel and repeat travel to the three watersheds. Salaries, direct costs and overhead are \$118,964, \$6,160 and \$2,853.

Phase IV, Final Report and Project Assessment - Phase IV is the reporting and wrap up part of the project. We prepare the draft report summarizing the findings of the watershed studies, circulate it to the Advisory Committee for review and seek feedback on the report. With the Advisory Committee and CALFED planning staff, we evaluate

### Reintroduction of Native Salmonids into Central Valley Headwaters: Bioengineering Requirements and Social Acceptability

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Planning and Conservation League Foundation -Project Budget  
 Calfed Ecosystem Restoration Program / Reintroduction of Native Salmonids in Central Valley Headwaters

Reintroduction of Native Salmonids into Central Valley Headwaters:  
 Bioengineering Requirements and Social Acceptability

Year 2													
			PROJECT MANAGER - PCL FOUNDATION						CONTRACTOR - HARZA				
Task #	Description	Schedule (months)	Total Hours	Total Salaries	Benefits 10%	Direct Costs	Overhead 15%	Total	Total Hours	Direct Costs	Salaries	Total Service Contracts	Total Cost
Analysis of the Upper Watersheds of Three Rivers (cont.)													
3g	Assess fish passage options	13-14	0	\$ -	\$ -	\$ -	\$ -	\$ -	232	\$ -	19,740	19,740	\$19,740
3h	Assess reservoir migration issues	13-14	0	\$ -	\$ -	\$ -	\$ -	\$ -	144	\$ -	12,240	12,240	\$12,240
3i	Productivity of the upper watershed habitat	14-15	0	\$ -	\$ -	\$ -	\$ -	\$ -	120	\$ -	8,400	8,400	\$8,400
3j	Assess tradeoffs	14-15	28	\$ 1,900	\$ 342	\$ -	\$ 285	\$ 2,527	40	\$ -	3,660	3,660	\$6,387
3k	Assess potential funding sources	15	12	\$ 660	\$ 155	\$ 750	\$ 129	\$ 1,694	16	\$ -	880	880	\$2,774
3l	Assess political feasibility	15	44	\$ 2,860	\$ 515	\$ 1,450	\$ 429	\$ 5,254	12	\$ -	1,580	1,580	\$6,834
4	Final Report and Project Assessment												
4a	Prepare draft report	15-16	40	\$ 2,440	\$ 439	\$ -	\$ 366	\$ 3,245	92	\$ 1,000	6,900	7,900	\$11,145
4b	Meet with Advisory Committee	17	44	\$ 2,700	\$ 486	\$ -	\$ 405	\$ 3,591	44	\$ 650	4,440	5,090	\$8,681
4c	Meet with Calfed planning staff	17	16	\$ 1,200	\$ 216	\$ -	\$ 180	\$ 1,596	44	\$ 650	4,440	5,090	\$8,686
4d	Revise Final Report, Design, Publish and Dissemina	18	32	\$ 1,920	\$ 346	\$ 2,100	\$ 288	\$ 4,654	142	\$ 1,000	9,090	10,090	\$14,744
				\$ -	\$ -	\$ -	\$ -	\$ -			-	-	\$0
5	Project Management		60	\$ 4,700	\$ 846	\$ -	\$ 705	\$ 6,251			10,800	10,800	\$17,051
Total Year 2:			276	\$ 16,580	\$ 3,344	\$ 4,300	\$ 2,787	\$ 29,011	886	\$ 3,300	\$ 82,370	\$ 85,670	\$ 114,681
Project Total, Years 1 and 2			931	\$ 60,215	\$ 10,839	\$ 9,625	\$ 9,032	\$ 89,711	2,073	\$ 25,550	\$ 181,525	\$ 207,075	\$ 298,786

BUDGET DETAIL #2 - BREAKDOWN OF DIRECT COSTS BY TASK																		
PCL FOUNDATION DIRECT COSTS																		
Description																		
Task	#	Schedule	airfare	commence	computer	copies	GIS	graphic	local	lodging	map	meal	misc	aerial	postage	report	supply	Total
		(months)	car rental				mapping		collect & data	acquisition	per diem	photos	Fedex	distrib.				
1			mileage						local mileage									
1a	1		1															
1b	1																	
1c	1-2																	
1d	1-2								50									50
1e	1-2																	
1f	1-2																	
1g	1-2																	
1h	3	60																60
1i	3																	
2																		
2a	3-8																	
2b																		
2c																		
2d																		
2e																		
2f																		
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7																		

BUDGET DETAIL #1 - BREAKDOWN OF DIRECT COSTS BY TASK																		
HARZA DIRECT COSTS																		
Task	Description	Schedule (months)	airfare car rental mileage	commu	computer	copies	GIS mapping	graphic	local data collect & local mileage	lodging	map acquisit.	meals/ per diem	miso	aerial photos	postage/ Fedex	report distrib.	supplie	Total
#	Project Team Hours to be Expended																	
1	Project Initiation																	
1a	PCL Foundation	1																
1b	Establish Advisory Committee	1																
1c	Prepare report maps	1-2									500							500
1d	Evaluate Sacramento/San Joaquin studies	1-2									500							500
1e	Evaluate Upper Yuba River Studies Program	1-2									500							500
1f	Evaluate Northwest fish passage studies	1-2									500							500
1g	Assess data related to the 11 rivers	1-2									500							500
1h	Initial meeting with Advisory Committee	3	310									600						910
1i	Harza	3		100	300										200			600
2	Watershed Screening																	
2a	Conduct Screening analyses	3-6		300	300										300			900
	Dam Assessments													11,000				11,000
	Habitat Quality/Barrier																	
	U.S. Lands																	
	Productivity/Constraints																	
	Hatchery																	
	Downstream Barriers																	
	Downstream Habitat																	
	Political-socio impediments																	
	WRAM																	
2b	Present results of screening analysis AD/Call	7	500	300					780			600	200					2,380
2c	Final draft of the watershed screening report	7																
3	In-Depth Analysis of the Upper Watersheds of Three Rivers																	
3a	Collect and assess existing data sources	7-8	200	800	800				800						800			3,400
3b	Interviews with stakeholders and informants	7-10																
3c	Review interviews/develop final study designs	10																
3d	Conduct upstream habitat assessments	10-12																
	GIS mapping							500										500
3e	Upstream fish pop'n and hatchery issues	10-12																
3f	Downstream issues/constraints to passage	10-12																
Total Year 1			1,070	1,500	1,400	-	-	500	1,580	-	2,500	1,200	200	11,000	1,300	-	-	22,250
Analysis of the Upper Watersheds of Three Rivers (cont.)																		
3g	Assess fish passage options	13-14																
3h	Assess reservoir migration issues	13-14																
3i	Productivity of the upper watershed habitat	13-15																
3j	Assess tradeoffs	13-15																
3k	Assess potential funding sources	15																
3l	Assess political feasibility	15																
4	Final Report and Project Assessment																	
4a	Prepare draft report	15-16			1,000													1,000
4b	Meet with Advisory Committee	17										650						650
4c	Meet with CalFed planning staff	17										650						650
4d	Revise Final Report, Design, Publish and Dis	18			1,000													1,000
5	Project Management																	
Total Year 2			2,140	3,000	2,000	-	-	-	-	-	-	1,300	-	-	-	-	-	3,300
Project Total, Years 1 and 2			3,210	4,500	3,400	-	-	500	1,580	-	2,500	2,500	200	11,000	1,300	-	-	25,550

BUDGET DETAIL #3 -		Project Team Hours and Salary Rates			
	PCL Foundation	Hourly Salary	Year 1	Year 2	Total
	Jerry Meral	85	207	112	319
	Jennifer Palyash	45	254	80	334
	Marc de la Vergne	65	194	84	278
	Total		655	276	931
	Harza				
	John Pizzimenti	135	170	92	262
	Tom Priestley	130	58	88	146
	Mary Lou	90	122	88	210
	Steve	60	188	104	292
	Dana	120	4	8	12
	Charles	115	128	100	228
	Dan	105	0	68	68
	Roger	80	80	0	80
	Jacqueline	55	67	162	229
	Drafting	50	108	48	156
	Total		925	758	1683

the success of the project and discuss recommendations for future work, which could include detailed assessment of one or more watersheds for actual fish restoration. Based on feedback, we complete the final report, disseminate it, and post it to the PCLF website. Total cost for Phase IV is \$58,307. The main components of cost in Phase IV are staff time for writing, time for review with the Advisory Committee and CALFED, and the hard costs of report design, production and dissemination. Salaries, direct costs and overhead are \$50,963, \$5,400 and \$1,944.

#### Answers to Specific Questions on PSP page 59

The PCL Foundation will serve as project manager and will carry out political/stakeholder analysis, reviews of all team work, coordinate Advisory Committee meetings, and coordinate the production and distribution of the final report. Harza Engineering will work as subcontractor to PCLF and will conduct the dams and fish passage analysis. Ken Hashagen, who will work under contract to Harza, will assist Harza in carrying out the biological analysis. The Harza contract, and their subcontract to Ken Hashagen are necessary because they supply the fish passage engineering and biological expertise the PCL Foundation requires to carry out this project. The hourly rates for all project staff are noted Budget Detail #3. Benefits for PCL Foundation staff are calculated at 18% of base salary. These are totaled in the "Benefits" Column. Travel for PCLF represents auto trips from Sacramento to the 11 watersheds. Travel for Harza represents trips by Concord and Portland, OR staff to Sacramento and to the 11 watersheds. PCLF and Harza's direct costs are fully presented, as best we can estimate 6 months before the project's start, in "BUDGET DETAILS #1 & #2, DIRECT COSTS." Ken Hashagen's direct costs are unknown at this time, but they will be fully incorporated into his hourly rate. No equipment will be purchased.

The PCL Foundation's overhead rate is 15% of base salary. It includes a pro-rata share of PCLF's utilities, rent, equipment maintenance costs, internet and basic phone service, bookkeeping costs, data entry and clerical staff, financial administration related to project funds, regular audit service, and insurance expenses. Project management by PCLF and Harza represents mainly coordination to ensure that Harza, PCLF and Ken Hashagen operate efficiently, perform tasks on time, and share information about our respective pieces of the scope of work in a timely fashion. Project management also includes inspection of project-specific reports as they are being drafted, validation of costs, preparation of periodic reports to CALFED, responses to questions by the public and by stakeholders, staff time to provide oversight of each task.

#### 2. Cost Sharing

We plan to apply for funding from the Four Pumps program and also from the National Fish and Wildlife Foundation, but at present, we have not secured additional funding for this project.

## G. LOCAL INVOLVEMENT

While it might prove possible to overcome the bio-engineering challenges that steelhead and salmon reintroduction present, the public opposition to re-introduction may prove more formidable due to conflicts over water resource utilization.

Re-introduction of endangered species has been controversial throughout the west. Wolf, Mexican wolf, and grizzly bear re-introductions and proposed re-introductions have been difficult, litigious, and very drawn out affairs, mostly due to concerns about public safety. In the case of salmon, conflicts about the use of water resources are at issue. It is conceivable that a program that might be possible technically, might not be implemented due to varying values with regard to resource use.

In this effort, the PCL Foundation will dedicate staff resources to visiting a wide variety of interest groups in the study watersheds. Rather than organize large meetings, in which stakeholders sometimes feel called on to publicly express hard line views, we will visit people one on one, to explore their positions and try to determine how to accommodate their needs in a way that lets the program proceed.

PCLF will have to explain that the constraints of the Endangered Species Act when the species are present in their native habitat do not apply when species are re-introduced. The take provisions are not as onerous, and it is possible to develop provisions that accommodate resource user interests.

Some of the types of interest groups we will contact will include local elected officials, conservation groups, fishing groups, timber companies, federal land agencies, water districts, utilities, mining companies, and representatives of the tourism and recreation industries. We have already identified many of these groups, and we will work with such organizations as the Regional Council of Rural Counties, Sierra Nevada Alliance, CSAC, and industry groups such as the California Forestry Association to identify key stakeholders in each watershed.

Gerald Meral, Marc de la Vergne, and Jennifer Palyash will meet with some of the most important stakeholders in each watershed, and try to determine how their concerns can be accommodated. Our goal will be to determine where the re-introduction would be most welcomed by local officials and interest groups. While biological and engineering criteria are obviously critical, the willingness of local people to see the fish re-introduced will also help determine which watersheds are recommended for further study and project implementation. Data from the political analysis will be combined with the results of the barriers analysis and the biological assessment to help form the basis for an overall assessment of fish passage feasibility in key watersheds.

## H. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The Planning and Conservation League Foundation is prepared to comply with all the state and federal standard terms. Signed copies of the required forms are attached.

## I. LITERATURE CITED

CALFED Bay-Delta Program. 1999. Ecosystem Restoration Program Plan, Strategic Plan for Ecosystem Restoration.

CALFED Bay-Delta Program. 1999. Ecosystem Restoration Program Plan. Volume 1 – Ecological Attributes of the San Francisco Bay-Delta Watershed.

CALFED Interagency Ecological Program Steelhead Project Work Team. 1998. Monitoring, Assessment, and Research on Central Valley Steelhead: Status of Knowledge, Review of Existing Programs, and Assessment of Needs.

California Department of Fish and Game. 1996. Steelhead Restoration and Management Plan for California.

Reynolds, F.L., T.J. Mills, R. Benthin, and A. Low. 1993. Restoring Central Valley Streams: A Plan for Action. California Department of Fish and Game.

United States Fish and Wildlife Service with assistance from the Anadromous Fish Restoration Program Core Group under Authority of the Central Valley Project Improvement Act. 1997. Revised Draft Restoration Plan for the Anadromous Fish Restoration Program.

Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, and P.B. Moyle. 1996. Historical and present distribution of chinook salmon in the Central Valley drainage of California. Sierra Nevada Ecosystem Project: Final Report to Congress, vol. III. Centers for Water and Wildland Resources, University of California, Davis, pp. 309-361.







PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Katherine Rakow  
Chairperson  
Alpine County Board of Supervisors  
P.O. Box 158  
Markleeville, CA 96120

Dear Supervisor Rakow:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

The project we are proposing involves assessing the suitability of various rivers and tributaries above the key dams in the Central Valley for restoration of spring run Chinook salmon and steelhead to their historic habitats. We will examine the suitability of the above-dam habitats for fish reintroduction; the various means that could be employed to assist fish to pass around key physical obstacles, such as dams; and the political feasibility of implementing a fish passage program.

The purpose of this project is to examine a variety of watersheds along the Western face of the Sierra Nevada and arrive at a conclusion as to which 2 or 3 rivers offer the best biological, physical and political conditions permitting a fish passage program to be designed and implemented. The results of the study will be included in a report that will be submitted to the CalFED Bay-Delta program and to the public.

The study will be coordinated by the Planning and Conservation League Foundation (PCLF). Harza Engineering, a leading expert in fish passage design and assessment, will lead the physical assessment, Ken Hashagen will lead the biological assessment, and PCLF will lead the political assessment. Our team will be assisted by an advisory committee of individuals and organizations that can provide the broad expertise and insights we will depend on to ensure that this study is conducted thoroughly and generates useful information. The team will include representatives from a wide range of candidate watersheds from as many as 15 Central Valley and Sierra Nevada counties.

*Chairman*  
David Hirsch

*Secretary-Treasurer*  
Roben Kirkwood

*Trustees*  
Frank Boren  
Harriet Burgess  
Russell Faure-Brac  
Coke Hallowell  
Michael Remy  
Gerald Secundy

*Executive Director*  
Gerald Meral, Ph.D.

926J Street, Suite 612, Sacramento, CA 95814 916-444-8726 Fax 916-448-1789  
Website: [www.pcl.org](http://www.pcl.org) Email: [pclmail@pcl.org](mailto:pclmail@pcl.org)  
A member of Earth Share of California

Recycled paper

We would hope to work closely with the appropriate representatives of your county and with the key public, private and nonprofit stakeholders who would likely be affected by an eventual fish passage program in your area. We will meet with key stakeholders in each of the 11 watersheds we will study. Once we have narrowed our list of 11 watersheds down to the 2-3 that will be selected for detailed study, we will contact the counties that contain those watersheds to discuss fish passage and related issues and your views on the suitability of fish restoration in your community.

Sincerely,

A handwritten signature in dark ink, appearing to read "Gerald H. Meral". The signature is fluid and cursive, with the first name "Gerald" being more prominent than the last name "Meral".

Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Mr. John S. Blacklock  
Clerk of the Board  
Butte County  
25 County Center Drive  
Oroville, CA 95965

Dear Mr. Blacklock

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

The project we are proposing involves assessing the suitability of various rivers and tributaries above the key dams in the Central Valley for restoration of spring run Chinook salmon and steelhead to their historic habitats. We will examine the suitability of the above-dam habitats for fish reintroduction; the various means that could be employed to assist fish to pass around key physical obstacles, such as dams; and the political feasibility of implementing a fish passage program.

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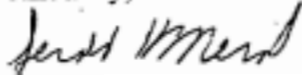
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926 J Street, Suite 612, Sacramento, CA 95814 916-444-8726 Fax 916-448-1789  
Website: [www.pcl.org](http://www.pcl.org) Email: [pclmail@pcl.org](mailto:pclmail@pcl.org)  
A member of Earth Share of California

Recycled paper

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Sincerely,

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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Richard Escamilla  
Amador County Board of Supervisors  
500 Argonaut Lane  
Jackson, CA 95642

Dear Supervisor Escamilla:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

The project we are proposing involves assessing the suitability of various rivers and tributaries above the key dams in the Central Valley for restoration of spring run Chinook salmon and steelhead to their historic habitats. We will examine the suitability of the above-dam habitats for fish reintroduction; the various means that could be employed to assist fish to pass around key physical obstacles, such as dams; and the political feasibility of implementing a fish passage program.

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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11,2000

Supervisor Bill Santucci  
Placer County Board of Supervisors  
175 Fulweiler Avenue  
Auburn, CA 95603

Dear Supervisor Santucci:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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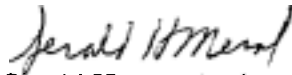
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Gerald H. Meral, Ph.D.  
Executive Director





PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11,2000

Supervisor Amie Gutman  
Sierra County Board of Supervisors  
P.O. Box D  
Downieville. CA 95936

Dear Supervisor Gutman:

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*Secretary-Treasurer*  
Robert Kirkwood

*Trustees*  
Frank Boren  
Harriet Burgess  
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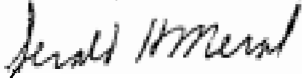
*Executive Director*  
Gerald Meral, Ph.D.

926 J Street, Suite 612, Sacramento, CA 95814 916-444-8726 Fax 916-448-1789  
Website: [www.pcl.org](http://www.pcl.org) Email: [pclmail@pcl.org](mailto:pclmail@pcl.org)  
A member of Earth Share of California

Recycled paper

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Sincerely,

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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor LaVada Erickson  
Siskiyou County Board of Supervisors  
P.O. Box 338  
Yreka, CA 96097

Dear Supervisor Erickson:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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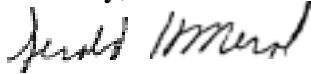
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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Alfonso Amaro  
Yuba County Board of Supervisors  
215 Fifth Street  
Marysville, CA 95901

Dear Supervisor Amaro:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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Gerald H. Meral, Ph.D.  
Executive Director



May 11,2000

Supervisor Mike McGowan  
Yolo County Board of Supervisors  
625 Court Street  
Woodland, CA 95695

Dear Supervisor McGowan:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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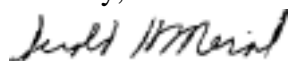
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Executive Director





PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor George P. Russell  
Tehama County Board of Supervisors  
P.O. Box 250  
Red Bluff, CA 96080

Dear Supervisor Russell:

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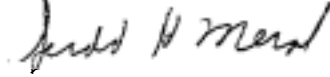
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Gerald H. Meral, Ph.D  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Casey Kroon  
Sutter County Board of Supervisors  
1160 Civic Center Blvd.  
Yuba City, CA 95993

Dear Supervisor Kroon:

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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Pat Paul  
Stanislaus County Board of Supervisors  
1100 H Street  
Modesto, CA 95354

Dear Supervisor Paul:

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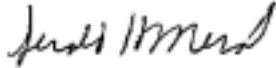
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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor John Silva  
Solano County Board of Supervisors  
580 Texas Street  
Fairfield, CA 94533

Dear Supervisor Silva:

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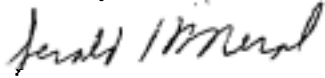
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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Mr. H. Douglas Latimer  
County Administrative Officer  
Shasta County Board of Supervisors  
1815 Yuba Street, Suite 1  
Redding, CA 96001

Dear Mr. Latimer:

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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Edward A. Simas  
Chairman  
San Joaquin County Board of Supervisors  
Courthouse, Room 701 222 East Weber Avenue  
Stockton, CA 95202

Dear Supervisor Simas:

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David Hirsch

**Secretary-Treasurer**  
Robert Kirkwood

**Trustees**  
Frank Boren  
Harriet Burgess  
Russell Faure-Brac  
Coke Hallowell  
Michael Remy  
Gerald Secundy

**Executive Director**  
Gerald Meral, Ph.D.

926 J Street, Suite 612, Sacramento, CA 95814 916-444-8726 Fax 916-448-1789  
Website: [www.pcl.org](http://www.pcl.org) Email: [pclmail@pcl.org](mailto:pclmail@pcl.org)  
A member of Earth Share of California

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Sincerely,

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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Mr. Terry Schutten  
County Executive  
Sacramento County  
700 H Street Room 7650  
Sacramento, CA 95814

Dear Mr. Schutten:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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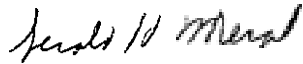
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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11,2000

Supervisor Patti Reilly  
Mariposa County Board of Supervisors  
5100 Bullion Street  
Mariposa, CA 95338

Dear Supervisor Reilly:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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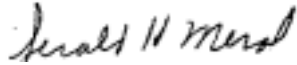
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Gerald H. Meral, Ph.D.  
Executive Director





PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Frank Bigelow  
Madera County Board of Supervisors  
209 West Yosemite Avenue  
Madera, CA 93637

Dear Supervisor Bigelow:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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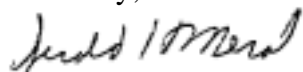
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Gerald H. Meral, Ph.D.  
Executive Director



PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Ed Robey  
Lake County Board of Supervisors  
255 North Forbes Street  
Lakeport, CA 95453

Dear Supervisor Robey:

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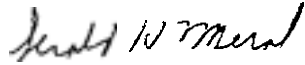
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Gerald H. Meral, Ph.D.  
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## PLANNING AND CONSERVATION LEAGUE

F O U N D A T I O N

May 11, 2000

Supervisor Charles E. Hams  
Glenn County Board of Supervisors  
526 West Sycamore Street  
Willows, CA 95988

Dear Supervisor Harris:

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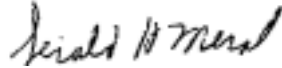
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Gerald H. Meral, Ph.D.  
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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Judy Case  
Chairman  
Fresno County Board of Supervisors  
2221 Kern Street  
Fresno, CA 93721

Dear Supervisor Case:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor William S. Bradley  
Chairman  
El Dorado County Board of Supervisors  
330 Fair Lane  
Placerville, CA 95667

Dear Supervisor Bradley:

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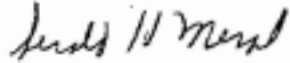
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PLANNING AND CONSERVATION LEAGUE  
F O U N D A T I O N

May 11, 2000

Supervisor Tom Tyron  
Chairman  
Calaveras County Board of Supervisors  
891 Mountain Ranch Road  
San Andreas, CA 952499789

Dear Supervisor Tyron:

The Planning and Conservation League, in association with Harza Engineering Company has applied to the CalFED Bay-Delta Program for funding to support a research project that may involve lands, rivers, or watersheds in your county. If funded, this project would start in February 2001 and would take approximately eighteen months to complete.

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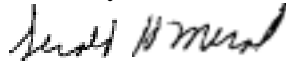
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## Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding

1. Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?

YES

XX

NO

2. If you answered yes to # 1, identify the lead governmental agency for CEQA/NEPA compliance.

Lead Agency

3. If you answered no to # 1, explain why CEQA/NEPA compliance is not required for the actions in the proposal

. This project is a research study only, which will have no environmental impacts. Studies are not subject to CEQA/NEPA compliance.

4. If CEQAMEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.

5. ~~Will the~~ applicant require access across public or private property that ~~the~~ applicant does not own to accomplish the activities in the proposal?

XX

YES

NO

If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with 30 days of notification of approval.

The purpose of this research project is to do an objective analysis that will result in the selection of 2-3 watersheds, out of a list of 12-15 candidates, for more detailed field study during the latter half of the study process. We will not have the data we need within 30 days of notification of approval to make that selection. However, as soon as we have identified those candidates, we will immediately seek the permission of the relevant land owners to gain access to the study areas. We will immediately provide CALFED with a listing of access needs and permission for access as soon as

6. Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

**LOCAL**

Conditional use permit	<input type="checkbox"/>	
Variance	<input type="checkbox"/>	
Subdivision Map Act approval	<input type="checkbox"/>	
Grading permit	<input type="checkbox"/>	
General plan amendment	<input type="checkbox"/>	
Specific plan approval	<input type="checkbox"/>	
Rezone	<input type="checkbox"/>	<input type="checkbox"/>
Williamson Act	<input type="checkbox"/>	
Contract	<input type="checkbox"/>	
Other <del>cancellation</del>		
(please specify)		
None required	<input checked="" type="checkbox"/>	

**STATE**

CESA Compliance	<input type="checkbox"/>	(CDFG)
Streambed alteration permit	<input type="checkbox"/>	(CDFG)
CWA § 401 certification	<input type="checkbox"/>	(RWQCB)
Coastal development permit	<input type="checkbox"/>	(Coastal Commission/BCDC)
Reclamation Board approval	<input type="checkbox"/>	
Notification	<input type="checkbox"/>	(DPC, BCDC)
Other		
(please specify)		
None required	<input checked="" type="checkbox"/>	

**FEDERAL**

ESA Consultation	<input type="checkbox"/>	(USFWS)
Rivers & Harbors Act permit	<input type="checkbox"/>	(ACOE)
CWA § 404 permit	<input type="checkbox"/>	(ACOE)
Other		
(please specify)		
None required	<input checked="" type="checkbox"/>	

DPC Delta Protection Commission

CWA = Clean Water Act

CESA California Endangered Species Act

USFWS U.S. Fish and Wildlife Service

ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act

CDFG = California Department of Fish and Game

RWQCB Regional Water Quality Control Board

BCDC = Bay Conservation and Development

Comm.

## Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

- i. Do the actions in the proposal involve physical changes to the land (i.e. grading, planting vegetation, or breaching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?

**YES**

XX

NO

2. If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).

This project involves research only.

3. If YES to # 1, what is the proposed land use change or restriction under the proposal?

4. If YES to # 1, is the land currently under a Williamson Act contract?

YES

NO

5. If YES to # 1, answer the following:

Current land use

### Current zoning

Current general plan designation

6. If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?

**YES**

NO

## DON'T KNOW

7. If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal?

YES

**NO**

9. If *YES* to #S, what are

the number of employees/acre

the total number of employees



will:



OMB Approval No. 0348-0043

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Standard Form 424 – Attachment 1  
Affected Counties

Alpine, Amador, Butte, Calaveras, El Dorado, Fresno, Glenn, Lake, Madera, Mariposa, Placer,  
Sacramento, San Joaquin, Shasta, Sierra, Siskiyou, Solano, Stanislaus, Sutter, Tehama, Yolo, Yuba

# BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

## SECTION A - BUDGET SUMMARY

Grant Program Function or Activity	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds			New or Revised Budget	
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Research		\$	\$	\$ 296,786	\$	\$ 296,786
2.						
3.						
4.						
5 Totals		\$	\$	\$ 296,786	\$	\$ 296,786

## SECTION B BUDGET CATEGORIES

6. Object Class Categories		(1)	(2) (3)	(4)	GRANT PROGRAM, FUNCTION OR ACTIVITY		(5)
							Total

a. Personnel		60,215	\$	\$	\$	60,215	\$
b. Fringe Benefits		10,839				10,839	
c. Travel		1,900				1,900	
d. Equipment (computer rental)		1,425				1,425	
e. Supplies		150				150	
f. Contractual		207,075				207,075	
g. Construction		0				0	
h. Other		6,150				6,150	
i. Total Direct Charges (sum of 6a-6h)		287,754				287,754	
j. Indirect Charges		9,032				9,032	
k. TOTALS (sum of 6i and 6j)		296,786	\$	\$	\$	296,786	\$

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Standard Form 424A (Rev. 7-97)  
Prescribed by OMB Circular A-1

SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	\$	\$	\$	\$
9.				
10.				
11.				
12 TOTAL (sum of lines 8-11)	\$0	\$	\$	\$0

SECTION D - FORECASTED CASH NEEDS					
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 182,105	\$	\$23,152	\$ 87,351	\$ 71,602
14. Non-Federal					
15 TOTAL (sum of lines 13 and 14)	\$ 182,105	\$	\$23,152	\$ 87,351	\$ 71,602

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
(a) Grant Program		FUTURE FUNDING PERIODS (Years)			
		(b) First	(c) Second	(d) Third	(e) Fourth
16.	\$114,681	\$ 56,375	\$ 58,307	\$	\$
17.					
18.					
19.					
20. TOTAL (sum of lines 16-19)	\$114,681	\$56,375	\$ 58,307	\$	\$

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges. Fully detailed in CalFed proposal "Budget Detail #1, Direct Costs"	22. Indirect Charges. 15% on base salaries total (\$60,215) = \$9,032
23. Remarks: Consultant costs include all biological and fish passage engineering feasibility analysis.	

**STANDARD CLAUSES -  
SERVICE & CONSULTANT SERVICE CONTRACTS FOR \$5,000 & OVER WITH NONPUBLIC ENTITIES**

**Workers' Compensation Clause.** Contractor affirms that it ~~is~~ aware of the provisions of Section 3700 of the California Labor Code which require every employer to be ~~insured against~~ liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the ~~performance~~ of the work under this contract.

~~Claims~~ **Dispute Clause.** Any claim that Contractor may have regarding the performance of this agreement including, but not limited to, claims for additional compensation or extension of time, shall be submitted to the Director, Department of Water Resources, within thirty days of its ~~accrual~~, ~~State~~ and Contractor shall then attempt to negotiate a resolution of such claim and process an amendment to this agreement to implement the terms of any such resolution.

**National Labor Relations Board Clause.** In accordance with Public Contract Code Section 10296, Contractor ~~declares~~ under penalty of perjury that no more than one final, unappealable finding of contempt of court by a federal court has been issued against the Contractor within ~~the~~ immediately preceding ~~two-year~~ period because of Contractor's failure to comply with an order of a federal court which orders Contractor to comply with an order ~~of the~~ national Labor Relations Board.

**Nondiscrimination Clause.** During the performance of this contract, the recipient, Contractor and its subcontractors shall not ~~deny~~ the contract's benefits to any person on the basis of religion, color, ethnic group identification, ~~sex~~, age, physical or ~~mental~~ disability, nor shall they discriminate ~~unlawfully~~ against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age (over 40), or sex. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), the regulations promulgated thereunder (California Administrative Code, Title 2, Sections 7285.0 et seq.), ~~the~~ provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Government Code Sections 11135 - 11139.5), and the regulations or ~~standards~~ adopted by the awarding State agency to implement such article. Contractor or recipient shall ~~permit~~ access by representatives of the Department of Fair Employment and Housing and the awarding State agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its ~~books~~, records, accounts, other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause. Recipient, Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

**Statement of Compliance.** The Contractor's signature affixed hereon and dated shall constitute a certification under penalty of perjury under the laws of the State of California that the Contractor has, unless exempted, complied with the nondiscrimination program requirements of Government Code Section 12990 and Title 2, California Code of Regulations, Section 8103.

**Performance Evaluation.** For consulting service agreements, Contractor's performance under this contract will be evaluated after completion. A negative evaluation will be filed with the Department of General Services.

**Availability of Funds.** Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

**Audit Clause.** For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

**Payment Retention Clause.** Ten percent of any progress payments that may be provided for under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under ~~the~~ contract.

**Reimbursement Clause.** If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: 926 J STREET, SUITE 612  
SACRAMENTO, CA 95814

**Termination Clause.** ~~The State may~~ terminate this contract without cause upon 30 days' advance written notice. The Contractor shall be reimbursed for all reasonable expenses incurred up to the date of termination.

**Minority/Women/Disabled Veteran Business Enterprise Participation Requirement Audit Clause.** Contractor or vendor agrees that ~~the~~ awarding department or its delegates will have the right to ~~review~~, obtain, and copy all records pertaining to performance of the contract. Contractor or vendor agrees to provide the awarding department or its delegate access to its premises, upon reasonable notice, during normal business hours for the purpose of interviewing employees and inspecting and copying such books, records, accounts, and other material that may be relevant to a matter under investigation for the purpose of determining compliance with Public Contract Code Section 10115 et seq. Contractor or vendor further agrees to maintain such records for a period of three (3) years after final payment under the contract. Title 2 CCR Section 1896.75.

**Priority Hiring Considerations.** For contracts in excess of \$200,000, the Contractor shall give priority consideration in filling ~~vacancies in~~ Positions funded by the contract to qualified recipients of aid under Welfare and Institutions Code Section 11200. (Public Contract Code Section 10353).

Agreement No. \_\_\_\_\_

Exhibit \_\_\_\_\_

**STANDARD CLAUSES -****SERVICE & CONSULTANT SERVICE CONTRACTS FOR \$5,000 & OVER WITH NONPUBLIC ENTITIES**

**Workers' Compensation Clause** Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this contract.

**Claims Dispute Clause** Any claim that Contractor may have regarding the performance of this agreement including, but not limited to, claims for additional compensation or extension of time, shall be submitted to the Director, Department of Water Resources, within thirty days of its accrual. State and Contractor shall then attempt to negotiate a resolution of such claim and process an amendment to this agreement to implement the terms of any such resolution.

**National Labor Relations Board Clause.** In accordance with Public Contract Code Section 10296, Contractor declares under penalty of perjury that no more than one final, unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of Contractor's failure to comply with an order of a federal court which orders Contractor to comply with an order of the national Labor Relations Board.

Agreement No.: \_\_\_\_\_

Exhibit: \_\_\_\_\_

**ADDITIONAL STANDARD CLAUSES**

**Recycled Materials.** Contractor hereby certifies under penalty of perjury that \_\_\_\_\_ (enter value or "0") percent of the materials, goods and supplies offered or products used in the performance of this Agreement meet or exceed the minimum percentage of recycled material as defined in Sections 121.61 and 12200 of the Public Contract Code.

**Severability.** If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

**Governing Law.** This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

**Y2K Language.** The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant." For purposes of this Agreement, a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

**Child Support Compliance Act.** For any agreement in excess of \$100,000, the Contractor acknowledges in accordance therewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable State and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code; and
2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

**ASSURANCES - NON-CONSTRUCTION PROGRAMS**

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

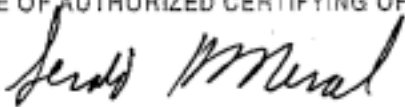
**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. 'Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards' to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.



9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91.190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §52131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 		TITLE EXECUTIVE DIRECTOR	
APPLICANT ORGANIZATION PLANNING & CONSERVATION LEAGUE FOUNDATION		DATE SUBMITTED 3/15/2000	

926 J Street, Suite 612  
Sacramento, CA 95814

## NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (REV. 3-85) FMC

## COMPANY NAME

Planning and Conservation League Foundation

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

## CERTIFICATION

*I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.*

## OFFICIAL'S NAME

Gerald H. Meral, Executive Director

## DATE EXECUTED

May 15, 2000

## EXECUTED IN THE COUNTY OF

Sacramento

## PROSPECTIVE CONTRACTOR'S SIGNATURE



## PROSPECTIVE CONTRACTOR'S TITLE

Executive Director

## PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Planning and Conservation League Foundation



# **PCL Foundation Mission and Accomplishments**

## **MISSION**

The Planning and Conservation League Foundation was founded in 1972 to protect the threatened California environment. A 501 (c)(3) organization, the PCL Foundation's purposes are to:

- 9 Conduct research to broaden the state of knowledge in a range of environmental policy areas including natural resources management, land use and protection of species
- 9 Develop specific recommendations policy makers and regulatory agencies can use to solve California's critical environmental problems
- 9 Deliver educational campaigns to promote better public understanding of environmental issues and possible solutions
- 9 Promote increased community involvement in environmental planning
- 9 Foster communication among diverse stakeholder groups, leading to greater consensus about how to protect the environment

## **PROJECT MANAGEMENT**

PCLF has the ability to conduct research projects substantially similar in scope to the proposed one, deliver products on time and on budget, manage complicated publications projects, manage large advisory committees, and work effectively with stakeholders to understand specific local issues related to the research and policy development projects it undertakes.

- 9 Hired & supervised Philip Williams & Associates in a 1999 study to examine the economic relationship between Sierra Nevada watershed restoration and resultant water quality and quantity downstream
- 9 Hired and supervised Paul Hrubec & Associates in a 1997 Sierra Nevada watershed restoration study

## **RESEARCH AND PUBLICATIONS**

PCLF has published nearly 20 public policy reports and one full-length book that have helped generate new data, educate the public about key conservation issues, and help decision makers to draft effective environmental laws, policies and regulations to protect California's rivers, lakes and watersheds. Some of PCLF's reports in the areas of watersheds, rivers and water quality include:

### ***The Benefits of Watershed Management: Water Quality and Supply***

Ivan Sohrakoff, (1999) A comprehensive report and literature review that examines the economic relationship between watershed, restoration techniques and downstream water quality and supply. **Pages: 95**

### ***Principles and Guidelines for Effective Restoration Efforts in California's Forested Watersheds, 1997.***

This study focuses on past, present and future efforts to restore California's forested watersheds to greater ecological health to develop a set of broadly accepted principles to help prioritize funding allocation decisions for current and future restoration work. **Pages: 17**

### ***Restoring the South Fork of the American River***

Alisa M. Shen, 1996. This report identifies the environmental, energy and recreational issues involved in the relicensing of the Upper American River hydroelectric project. It reviews the

obligations and steps required as part of the Federal Energy Regulatory Commission relicensing, and suggests some collaborative strategies for addressing likely relicensing issues. Pages: 75

***A Comparison of Dept of Fish & Game's Hatchery and Habitat Restoration Funding***

Jennifer Palyash, Research Associate, June 1997. This report analyzes DFG's funding of hatchery and habitat restoration programs and demonstrates that the Dept. of Fish and Game allocates twice as many resources to hatcheries as it does to natural habitat and restoration projects. Pages: 8

***Questions to Ask About Water Projects***

Gerald H. Meral, Ph.D., Executive Director, 1986. This publication presents a wide variety of questions that conservationists should ask when a local water project is proposed. Hydroelectric, irrigation, water supply, flood control and other water projects are considered. Pages: 14

***The State of the State's Rivers and Bays***

Alvin J. Greenberg, Ph.D., and Gordon Hart, Coro Foundation Fellow, 1986. This report provides a review of toxic pollution of surface waters of California, and this report points out problems caused by manufacturing, timber, agriculture, and mining industries. Pages: 9

***The Economic Impacts and Benefits of White Water Recreation in California***

Susan Andrus, 1984. This report analyzes the economic and employment contributions California's white water recreation industry provides to the state. The industry is valued at \$60 million each year. Pages: 78

***Merging Currents: Transportation and Water Quality***

Sandra Spelliscy, General Counsel, January 2000. This guidebook provides detailed information to citizens' groups, city and county planning agencies about how to procure federal transportation funding to enhance water quality and wildlife habitat and to mitigate the water-related environmental effects of transportation projects. Pages: 45

**STAKEHOLDER OUTREACH AND COORDINATION**

PCLF has more than 25 years of experience in coordinating stakeholder coalitions to discuss environmental issues, develop conservation funding mechanisms, and make policy recommendations. The PCL Foundation is well known as an organization that can work with diverse stakeholders to fashion an outcome which many, if not all, can endorse. Examples include the following:

- |      |   |
|------|---|
| 1987 | Organized more than 50 groups, including businesses and conservation groups to support what turned into a statewide \$776 million park and wildlife bond measure.                                 |
| 1988 | Worked with doctors, nurses, insurance companies, social action groups, and others to create a plan which became Proposition 99, the tobacco tax ballot measure.                                  |
| 1989 | Organized a coalition of transit districts, transportation companies, labor unions, conservation groups, and transit advocates to prepare what became a successful \$2 billion rail bond measure. |
| 1993 | Created a coalition of business, labor, environmental, landowner, and government leaders to support what became the largest park bond act ever proposed to the voters of California.              |

- 1997 Put together a coalition of farm, business, labor, environmental, health, senior, and government interest groups to craft the most important air quality measure ever presented to California voters.

#### WATER, WATERSHED AND RIVER POLICY EXPERTISE

PCLF staff have extensive experience in issues related to rivers, watershed protection, and water resource management. PCLF has developed an unparalleled expertise in the policymaking process and a repository of institutional memory on legislative and regulatory matters. As a result, PCLF is frequently consulted by policymakers in the development of rivers and water management policy. The Foundation conducted research and developed ideas that were incorporated into many of California's strongest environmental laws, including:

- 9 the Wild & Scenic Rivers Act
- 9 the Lake Tahoe Compact
- 9 Park Bond Act (2000)
- 9 Water Bond Act (2000)

As a result, it has long served as a trusted non-partisan advisor to governors, legislators and legislative staff.

#### OTHER ACTIVITIES

The Foundation offers monthly workshops and an annual symposium that educate citizens, planners and elected officials about environmental laws and effective participation in local, state and regional land use decision making. The Foundation publishes an award-winning newsletter, *California Today*, six times per year and publishes the daily electronic news service, ***California Environmental News***. The PCL Foundation is a founding member of the California Futures Network, which works to develop reforms of statewide land use policies and to promote more sustainable development practices. The PCL Foundation is a founding member of the California Environmental Dialogue, which is an industry-environmental forum that seeks to find common ground on statewide environmental policy matters.

Gerald H. Meral, Ph. D.  
Executive Director  
Planning and Conservation League Foundation

Gerald H. Meral has been Executive Director of the Planning and Conservation League Foundation since 1983. Meral received a bachelor's degree in Zoology from the University of Michigan in 1965 and a Ph.D. in Zoology from the University of California, Berkeley, in 1973. Meral oversees all development, long range planning and professional staff activities. From 1975 to 1983, Meral was deputy director of the California Department of Water Resources. In this role, he supervised the Energy and Water Development and Planning Programs, the Office of Water Conservation, and the Delta Planning Program. Previously, Meral served as staff scientist for the Environmental Defense Fund, where he worked as program manager of the Western States Water Program.

Meral oversaw the research and development that led to Propositions 70, 99, 116, 117, 180 and 185, which created more than \$16 billion in new environmental conservation funding.

Dr. Meral served on the predecessor to the Bay-Delta Advisory Committee in 1991. He also served on the CalFed Committee seeking to create new institutional governance mechanisms.

In 1994 he played a key role as a representative of the environmental community in creating Proposition 204, which included hundreds of millions of dollars for CalFed restoration activities.

From 1997 to 2000 he played a leadership role in placing Proposition 13 (water bond act) on the ballot, helping to craft its provisions, lobbying it in the Legislature, and playing a key role in educating the public about the merits of the measure. Proposition 13 included hundreds of millions of dollars in funds which will be used to implement the CalFed Record of Decision.

Founded Friends of the River in 1973, in organizing Proposition 17 statewide initiative effort to stop New Melones Dam on the Stanislaus River. Member Sierra Club Tuolumne River Conference since inception, and also member of Delta San Joaquin River Basin Task Force in early 1970's. Meral is an active whitewater river runner. Made first descents of Mocassin Creek, West Walker River, Cherry Creek run of Tuolumne River, Sierra City to Downieville section of South Yuba. Second descent and first well known run of Tuolumne from Lumsden Campground to Ward's Ferry Bridge. First descent of Grand Canyon (Colorado River) by C-1 from Lee's Ferry to Pierce Ferry, 1969.

Awards: Perception River Conservation Award, 1984; California Trout Roderick Haig Brown award, 1989; and WATER conference award for water policy, 1996.

Jennifer Palyash, **B.A.**  
Outreach Coordinator and Research Assistant  
Planning and Conservation League Foundation

Jennifer Palyash has worked on a variety of PCL Foundation projects that involve a broad array of participants in order to accomplish shared goals. Palyash was involved with the PCL Foundation's Sustainable Sierra project, a yearlong effort to build on the knowledge base developing around Sierra Nevada issues by conducting research and outreach to local grassroots organizations, businesses and government agencies. Palyash interviewed local groups in Chico and Porterville about their pressing Sierra Nevada projects and issues, and organized a community outreach forum in Chico that addressed current projects, as well as watershed and fire prevention issues in the Sierra. Several reports were also completed during the Sustainable Sierra project that shed light on these issues and suggested potential funding sources for habitat restoration and fire prevention projects. Palyash interviewed and collected comments from businesses, government agencies and organizations for one Sustainable Sierra report - "*Principles and Guidelines for Effective Restoration Investments in California's Forested Watersheds*." These comments were then used to make improvements to the final version of the report.

Palyash also researched and wrote three reports for the Sustainable Sierra project: the *Fire Cost Recovery Report* provided background information on the California Department of Forestry and Fire Protection's (CDF) proposal to redirect fire cost recovery funds from the state's General Fund directly to CDF; *A Comparison of Department of Fish and Game's Hatchery and Habitat Restoration Funding Report* illustrated the need for natural fisheries restoration projects; and the *California State Environmental Budget Report for 1997-1998* substantiated the fact that environmental funding was needed at the state level, a conclusion reached in many of the reports completed as part of the Sustainable Sierra project.

Palyash also organizes the annual PCL Foundation issues symposium that involves local organizations, businesses and agencies in panel discussions, and she is involved with organizing the California Environmental Quality Act (CEQA) workshop series that educates citizens and agencies on how they can participate effectively with local land use decision-making. Palyash received a degree in Environmental Biology and Management from the University of California, Davis before joining the Planning and Conservation League Foundation in April 1997.



**Marc G. de la Vergne**  
**Associate Director**  
**Planning and Conservation League Foundation**

Marc de la Vergne joined the PCL Foundation staff in January 1997 as Associate Director. He served as assistant project manager on PCLF's 1999 ***Benefits of Watershed Management: Water Quality and Supply*** research study, creating an Advisory Committee helping to coordinate research and supervising progress by the project's sub-contractor, Philip Williams and Associates, and its researcher, Ivan Sohrakoff.

De la Vergne also directs PCLF's Central Valley basin and foothills citizen training program, which has trained 500 activists, attorneys, business people and government planners to participate effectively in public environmental decision making processes. He is the author of the ***Central Valley Grassroots Guide***, which is a compendium of more than 400 Central Valley groups (floor and foothills) that focus on land use and watershed issues.

De la Vergne manages all PCLF's grants and coordinates reporting to funders. He assists in the day-to-day management of the PCL Foundation. In 1988, he received the degree of Master in Public Policy from the John F. Kennedy School of Government at Harvard University, with a concentration in community development policy. He also received a bachelor's in Political Science from U.C. Berkeley, from which he was graduated Phi Beta Kappa and Summa Cum Laude in 1985.

De la Vergne returned to California and to environmental issues after working for a decade as a project manager in the community development field. In that capacity, he managed project teams in the public, private and non-profit sectors, with responsibility for coordinating projects with budgets in excess of \$20 million. His relationship with PCLF began in 1983, when he was a summer intern and researcher while in school.

## Harza Engineering Company

Harza Engineering Company is a water resource engineering firm founded in Portland Oregon in 1920. Beginning in the 1950's with the recognition of the need to protect fishery resources, the company developed expertise in fish hatchery engineering, followed by fish ladder design. Since 1992, Harza scientists and engineers have worked on state of the art fish passage, fish capture and fish handling projects at dams in states on the Pacific Coast. Examples of our work include the following:

- The 1992 Silver Award for the Eicher juvenile bypass screen at Elwha Dam.
- Conceptual design of the surface by pass collector prototype at Lower Granite Dam.
- Design and specifications of the juvenile comer collector at Bonneville II Powerhouse.
- Re-design of Bonneville fish hatchery indoor fish facilities.
- Fish-screen designs for turbine intakes at Priest Rapids dam.
- Fish-passage collection facilities, transport plan, experimental hatchery at Cowlitz Falls Dam.
- Fish-capture facilities and transport plan for bull trout and west slope cutthroat trout at Milltown Dam on the Clark Fork.
- Fish passage design alternatives and gas supersaturation mitigation at Yacyreta, Argentina.
- Monitored upstream and downstream migration of adfluvial bull trout in the North Fork Lewis River.
- Bull trout Biological Assessment at Methow River mitigation project.
- Salmonid disease protocols and field research Cowlitz River, Washington.
- McNary fish attraction hydroelectric project, awarded Green Energy status in 1999.
- Downstream salmonid migration studies at Mayfield and Mossyrock dams.
- Upstream migration fall back studies using radio-tags of Columbia River fall chinook.
- PIT tag data analysis of juvenile and adult Snake River spring chinook.
- Thermal modeling studies affecting trout survival, Madison River, Montana.

Because design criteria in the Pacific Region are biologically very demanding, our fishery scientists work in close coordination with our hydraulic and structural engineers devoted exclusively to fishery engineering projects. In fact, we have a Business Unit at Harza devoted exclusively to fish facilities. The resumes that follow summarize the qualifications of the Harza staff who will be assigned to this project.

# JACQUI BLAKELEY

## KEY QUALIFICATIONS

Ms. Blakeley has over twenty years of experience in the graphics field, having worked in the fields of typography, offset printing, and traditional and computer pre-press production. Jacqui's fine arts education focused on three-dimensional work, providing a compositional integrity to signage and architectural-related projects. In addition to her design skills and management capabilities, she has a high degree of technical expertise. Having worked in the engineering field producing high-end desktop published collateral materials for the past nine years, Ms. Blakeley also maintains a freelance business.

## EDUCATION:

- B.A. Studio **Art**, Cum Laude, University of Washington, Seattle, 1989
- Certificate, *Graphic Arts*, Washington Technical Institute, 1982

## TOOLS:

- WinNT utilities, Internet and FTP tools; Microsoft Powerpoint, Word, Excel and Access; Adobe Photoshop, Illustrator, Acrobat, InDesign and PageMaker; CorelDraw; Macromedia Dreamweaver and Fireworks; as well as a variety of scanning and OCR utilities

POSITION IN FIRM: Graphic Designer

YEARS WITH FIRM: 2

TOTAL YEARS OF EXPERIENCE: 21

## DESIGN EXPERIENCE:

Corporate Graphics Manager, Harza Engineering Company, Inc., Bellevue, Washington, USA

Hired as supervising graphic designer for the Western Division (Washington, Oregon, and California) in January 1998, became National Corporate Graphics Manager of this Chicago-headquartered engineering firm in 1999. As part of the core corporate marketing, communications and graphics team, is responsible for collaboratively directing; designing, and implementing the firm's image through all published materials in domestic and international offices. Products of note include: newsletters, websites, brochures, manuals, presentations and proposal collateral materials. Areas of significant contribution include in-house training program and manual development, corporate marketing procedure development and corporate standards and templates.

Senior Graphic Designer, R.W. Beck, Inc., Seattle, Washington, USA

As a member of a three-person graphic design team from 1989 to 1998, emphasis was placed on high quality, high volume, fast-turnaround, short run projects. Responsibilities included rapid concept generation, development and management of project budgets, and direction and implementation of in- and out-of-house production. Areas of significant design proficiency were: electronic presentation development, manual and document design, computer illustration and diagramming, newsletter and brochure design.

### Independent Design, Various Clients

From 1990 to present, has maintained independent working relationships with a variety of clients. Recent ongoing projects involve: corporate and product identity and logo development, website design, presentation building, business and collateral materials design and implementation.

Clients include:

- Entreon Corporation, Minneapolis, Minnesota (Corporate and product identity design, corporate presentation development, developer graphics support.)

- Earthues Company, Seattle, Washington (Identity design update, product packaging, branding strategy.)
- Passage Events and Promotions, Inc., Seattle, Washington (Corporate presentation, advertisement and promotional design.)
- Embrace the Moon School of Tai Chi and Ch'i Kung, Seattle, Washington (Newsletter design and implementation.)
- Vipassana Research Publications of America, Inc.
- Community Planning & Research, Inc.
- University of Washington School of Medicine
- Ostex International Corporation
- Omeros Medical Systems, Inc.
- Black Creek Farms
- University of Washington Pharmacy Group
- Mortgage Options
- NeoRx Corporation
- Westin Hotels
- Avenue A, Inc.
- Seattle Aikikai
- Electricity Journal
- Women's Soccer Foundation

# CHARLES W (BILL) CUTTING, P.E.

Fisheries Engineer

Total years of experience: 23

## QUALIFICATIONS

C. W. (Bill) Cutting has over 20 years of experience in the industry and has provided his project management and technical leadership skills for hundreds of fisheries and wildlife habitat development projects throughout the west. In addition to his fisheries experience, Bill has provided project management and engineering design services for the hydroelectric and electric power transmission industries and for road and highway projects. Bill has provided civil, structural and fisheries expertise for value engineering studies throughout the U.S. for a variety of federal, state and local agencies.

Bill has extensive experience in the planning, design and construction of cool- and cold-water fish facilities throughout the western U.S. He is experienced in all aspects of hatchery design and operations including water collection, distribution, treatment, disinfection and disposal; raceways, rearing ponds and egg incubation facilities; adult capture and spawning; upstream and downstream fish passage; and support facilities such as office buildings, shops, storage buildings, cold storage and freezers, emergency power supply, alarm and monitoring systems and utilities. For wildlife refuges, he has designed water intakes, canals, pipelines and water control structures; developed plans and construction documents for excavation and grading to create and enhance waterfowl habitat; and provided planning and design for headquarters complexes, maintenance shops and interpretive centers.

### Education

- B.S., Civil Engineering, Oregon State University, 1976

### Continuing Education

- 40-Hour Value Engineering Training Workshop, 1989

### Professional Registrations

- Civil Engineer, Washington, 1981
- Idaho, 1985
- Oregon, 1992

### Professional Societies

- American Society of Civil Engineers
- International Ozone Association
- Association of Conservation Engineers
- American Fisheries Society

## EXPERIENCE

### Coleman National Fish Hatchery, Anderson, California

U.S. fish and Wildlife Service

Project Manager for planning and design of an ozone water treatment system to disinfect the water supply to the hatchery. Repeated outbreaks of 13 different fish diseases led to the planning and construction of an ozone water treatment system with the ultimate capability to disinfect up to 65,000 gpm of surface water from Battle Creek. Over a ten year period, a number of planning studies were conducted to evaluate different options for disinfection of the hatchery water supply. Following a comparison of costs and likely effectiveness of ozone, chlorine and ultraviolet light, along with the development of a groundwater source, an ozone pilot plant was constructed. Although relatively effective in disinfecting the water, a number of operational and reliability deficiencies led to the planning and design of an entirely new, modular treatment system to provide a high degree of process reliability and allow construction in a series of phases to meet the projected availability of construction funds.

### Coleman National Fish Hatchery, Anderson, California

U.S. fish and Wildlife Service

Project Manager for planning, design, and construction assistance for a \$2.5-million adult salmon and trout holding and spawning facility. Project consists of a 160-foot by 110-foot metal building containing two

holding ponds and an automated spawning and sorting facility at one of the largest federal fish hatcheries in the Western U.S. Water chilling and recirculation systems are included for long term holding of spring and winter chinook salmon. Hydraulic and pneumatic equipment assist in the crowding, lifting, anesthetizing, sorting, and spawning of as many as 3,000 fish per day during the annual taking of 25 million eggs for hatchery operations.

### Coleman National Fish Hatchery, Anderson, California

U.S. fish and Wildlife Service

Project Manager for work with the prime consultant on an Analysis of Alternative Water Supply Intakes. The project scope included an assessment of the two existing water intake and conveyance systems including an evaluation of their suitability with regard to eight criteria items ranging from water quality to long term performance. Estimates of current and future water demands for fish production were also prepared for use in evaluating alternatives. Nine alternative intake configuration alternatives were developed and evaluated and sections of the final study report were prepared.

### Cedar Creek Hatchery, Hebo, Oregon

Oregon Department of fish and Wildlife

Project Manager for preparation of a programming and conceptual design document for a new adult fish holding and spawning facility at the Cedar Creek Hatchery. The facility will have the capability to hold up to six different runs of steelhead and

chinook salmon from the Siletz and Nestucca River system. The spawning building includes provisions for sorting fish to the holding ponds, for transferring them into liberation trucks for return to the creek mouth and for returning them to the creek above the fish barrier dam. Other amenities will include visitor viewing areas, a new river pump station and a new fish ladder from Three Rivers to the holding ponds.

### Cedar Creek Hatchery, Hebo, Oregon

Oregon Department of fish and Wildlife

Project Manager for planning, design, specification preparation, cost estimates, permitting and construction support services for a movable fish barrier on Three Rivers at the Cedar Creek Hatchery. The barrier consists of four independent rack panels which can be raised to stop fish passage and lowered to clear debris or allow fish passage. A hydraulic system operates the barrier without the need for hatchery staff to enter the water. The project also included construction of a sump for a future river pump station and the entrance section of a fish ladder from Three Rivers to a proposed new adult fish facility.

### Uilcene National Fish Hatchery, Uilcene, Washington

U.S. fish and Wildlife Service

Project Engineer for preparation of a flood study, environmental assessment and plans, specifications, and cost estimates for construction of a new 40 cfs capacity surface water intake, pipeline, concrete river sill, and floodplain sill.

**KENNETH A. HASHAGEN**  
**3512 NORTH LAKESHORE BLVD.**  
**LOOMIS, CA 95650**  
**(916) 652-3512**  
**KHASHAGEN@MINDSPRING.COM**

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#### **KEY QUALIFICATIONS:**

Fishery Biologist with California Department of Fish and Game 1964–2000

- Directed a 9-member statewide Advisory Committee on Salmon and Steelhead Trout to develop a comprehensive, statewide Salmon and Steelhead Management Plan.
  - Designed and implemented grant programs (\$17 million annually) from the passage of enabling legislation through the preparation of contracts. Responsibilities included solicitation of requests for proposals for habitat improvement and fish rearing projects, analysis of proposals, presentation of recommended program to the directorate, preparation of contracts, and approval of invoices.
  - Directed the Natural Diversity Data Base in the Natural Heritage Division, a state-wide, electronic data base which identifies the known locations of all rare, threatened, and endangered plants, animals, and natural communities in California,
  - Directed the activities of the Commercial Salmon Trollers Stamp Committee, a committee of eight commercial fishermen, representing all salmon fishermen in California. Program identified and funded habitat and fish rearing programs.
  - Coordinated California's hatchery program which includes 22 hatcheries statewide (\$15 million budget, 180 staff). Directly involved with regional coordination, acquisition and exchange of eggs with other states, and design of new hatcheries and modernization of existing facilities.
  - Served as Editor-in-Chief of the technical journal California Fish and Game (1978-1981). Associate editor for this journal for several years prior to being Editor-in-Chief.
  - Wrote memos, issue papers, and general correspondence for the Division Chief and the Directorate. Similar activities for the Natural Heritage Division.
  - Made oral presentations to Division Chiefs, Regional Managers, the Directorate, and the public on a routine basis.
  - Made frequent technical presentations to professional societies and wrote technical and popular articles for publication.
  - Coordinated activities, on a routine basis, between the Department and other State or Federal agencies, public groups, and individuals.
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#### **EDUCATION**

University of California, Davis 1964 B. A., Zoology

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#### **Professional Activities:**

Pacific Fishery Biologists

American Fisheries Society

1999-00 President, Western Division, American Fisheries Society

1998-99 Vice President, Western Division, American Fisheries Society 1998-99 President-Elect, Western Division, American Fisheries Society

1997-98 Member, National Membership Committee, American Fisheries Society

1996-97 Local Arrangements Chair, 1997 Annual Meeting

- 1994-95 Member of National Continuing Education Committee  
1986-88 Member of Chapter Continuing Education Committee responsible for establishing new **courses and** developing the course catalog. Member of National Committee on Continuing Education, appointed December 1986.  
1985-86 Directed the Chapter's Education and Training Program, **coordinating** the presentation of **courses in technical report writing** and statistics.  
1984 Chairman, Awards Committee, Chapter  
1983-84 Member, National AFS, Publication Overview committee  
1982 President, Cal-Neva Chapter  
1981 President-elect, Cal-Neva Chapter  
1979 Chairman, Bylaws and Nominations Committee, Chapter  
1978 Chairman, Bylaws and Nominations Committee, Chapter  
1977 Chairman, Bylaws and Nominations Committee, Chapter  
1976 **Treasurer**, Chapter  
1975 Treasurer, Chapter  
1974 Editor, Chapter Newsletter, Pisces  
1973 Editor, Chapter Newsletter, Pisces  
1972 Chairman of Chapter Membership Committee  
1972 Member of Division Membership Committee

Member, Continuing Education Committee  
Member, Distinguished Service Award Committee  
Member, Board of Appeals

Edited the annual California-Trout Symposium proceedings in 1977, 1979, 1980 and 1981  
Edited the proceedings of the Desert Tortoise Council in 1980 and 1981.

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#### **AWARDS:**

Award of Merit. 1994. Western Division, American Fisheries Society.  
Award of Merit. 1991. Western Division, American Fisheries Society.  
Distinguished Service Award. 1989. Commercial Salmon Trollers Stamp Committee,

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#### **SELECTED PUBLICATIONS**

Hashagen, Ken and Mike Haynie

- 1993 The Value of Hatcheries.. Outdoor California, May-June, pp. 22-24.

Hashagen, Kenneth A.

- 1991 The Salmon Stamp Program, Pages 230-235 in Alan Lufkin, ed. California Salmon and Steelhead, University of California Press, Berkeley, CA.  
1988 California's Hatchery System. Outdoor California. March-April 1988, pp. 5-8.  
1987 Commercial Salmon Trollers Stamp Program. Outdoor California. September-October 1987, pp. 9-12.  
1984 The Social and Political Ramifications of Stream Rehabilitation: The California Perspective. Pages 267-272 in Thomas J. Hassler, ed., Pacific Northwest Stream Habitat Management Workshop. Humboldt State University, Arcata, CA 95501.  
1984 Steelhead. Outdoor California. January-February 1984, pp. 15-16. (Wildlife Leaflet).



# MARYLOUISE KEEFE, PH.D.

POSITION IN **FRM** Senior Fisheries  
Scientist

YEARS WITH **FRM** 1

TOTAL YEARS OF EXPERIENCE: 15

## KEY QUALIFICATIONS:

Dr. MaryLouise Keefe is a Senior Fisheries Scientist in Harza's Portland, Oregon office. Dr. Keefe is responsible for supervising and conducting ESA and NEPA compliance projects and fisheries investigations, including threatened and endangered species, study design, field investigations, report preparation and agency consultation. Her primary areas of expertise include resident and anadromous salmonids, with an emphasis on general ecology, life-history, and hatchery monitoring and evaluation. While with the Oregon Department of Fish and Wildlife, she served as the Endangered Species Act Coordinator for the Northeast Region.

## EDUCATION:

- Doctor of Philosophy in Biological Sciences, University of Rhode Island, 1990.
- Graduate Courses, University of South Florida, 1984.
- Bachelor of Arts, Biology, Smith College, 1983.

## PROFESSIONAL AFFILIATIONS:

- American Fisheries Society; Sigma Xi; Society for Women in Natural Resources

## HONORS AND AWARDS

- 2000 Merit Award, Oregon Chapter of the American Fisheries Society
- 1999 Diversity Award, Northeast Region Oregon Department of Fish and Wildlife.
- 1995 Pride Award, Oregon Department of Fish and Wildlife

## EXPERIENCE RECORD:

### Oregon Department of Fish and Wildlife

Endangered Species Act coordinator. Coordinated all endangered species activities in NE Region of ODFW. Responsible for completion of ESA permits, annual reports, and agency consultation. Project leader for spring chinook salmon early life history, smolt migration and natural escapement monitoring studies. These studies were funded by BPA. Project leader for an evaluation of the Umatilla Hatchery, funded by BPA. Led an investigation funded by the Pacific States Marine Fisheries Commission of the smolt migration characteristics and parr-to-smolt survival of naturally produced spring chinook in the Grande Ronde and Imnaha river basins. Coordinator for Eastern Oregon bull trout activities.

### Santa Ana EA

As a member of the FERC Relicensing Team, Dr. Keefe, is responsible for fisheries resources issues and writing corresponding sections of the E.A. The Project involves collaboration and coordination with FERC staff and Santa Ana team members. Project also involves both ESA listed and candidate fish species.

### Kellogg Creek and Mt. Scott Watershed Assessment

As a senior fisheries scientist, Dr. Keefe is leading the Harza team through an assessment of habitat limiting factors and fish passage conditions for ESA listed fishes in the watershed. In addition she is responsible for facilitation of interagency team meetings and public workshops.

### Clark Fork River Fish Transport Plan

Lead scientist in developing an effective Fish Transport Plan for ESA listed Bull Trout on the Clark Fork River in Montana. Plan includes risk assessment and genetic considerations, as well as providing best options to help restore adfluvial components of these listed populations.

### Willamette Falls APEA

As Deputy Project Manager, Dr. Keefe, is responsible for assisting with project operations and coordination among PGE, agencies and key stakeholders in this collaborative APEA process. In addition, she has provided input on fisheries resource issues to internal PGE team and PGE staff biologists.

### COA Environmental Assessment COA Tribe/Bonneville Power Administration

Task leader for BPA NEPA project. Lead writer and researcher for EA for Coeur d'Alene tribal trout hatchery. Responsibilities include agency consultation and interdisciplinary team facilitation. This project involves assessing impact on five threatened, endangered or candidate species.

### BPA/NEPA Analysis

Task leader for Biological Assessment of construction activities associated with renovation of the Methow River Irrigation District. Responsibilities include lead writer, research, and agency consultation. Project involved assessment of impact on seven threatened, endangered, or candidate species.

### Eastern Oregon University

As adjunct assistant professor in biology, developed and taught courses in fish biology and fisheries management.

## Selected Papers

"Investigations into the early life history of spring chinook salmon in the Grande Ronde River Basin." M. Keefe, J. Vincent Tranquilli, P. Sankovich, E. Van Dyke, B.C. Jonasson, and R.C. Carmichael, Oregon Dept. of Fish and Wildlife Annual Progress Report. (1998).

"Smolt migration characteristics and mainstem Snake and Columbia River detection rates of PIT-tagged Grande Ronde and Imnaha River naturally produced spring chinook salmon." P. Sankovich, M. Keefe and R.W. Carmichael. Annual Progress Report to the Bonneville Power Administration, Portland, OR. (1995).

Electrofishing as a potential hazard to the survival and development of brook trout embryos." M. Keefe, T.A. Whitesel, and P Angelone. North Am. J. Fish. Mgmt. In Press.

Chemically medicated avoidance behavior in wild brook trout, (*Salvelinus fontinalis*): The response to familiar and unfamiliar fishes and the influence of fish diet." M. Keefe. Can. J. Zool. 70:288-292. (1992).

"Chemosensory attraction to home stream and population cues by native brook trout, (*Salvelinus fontinalis*), from two Southern New England streams." (M. Keefe and H.E. Winn) Can. J. Fish. Aquat. Sci. 48 (5):938-944. (1991).

## SUMMARY

**Dr.** Pizzimenti is Manager of the Harza Engineering Office in Portland, Oregon. His technical duties include management of fish and wildlife projects in the Northwest. One of John's major projects is as principal technical advisor to Bonneville Power Administration on salmon recovery efforts across the 22,000 **Mw** Federal Columbia River Power system—a system of 29 hydroelectric power plants in the Columbia River basin.

In addition to environmental project management, Dr. Pizzimenti is responsible for new projects, costs and budgets, agency coordination, and permitting. Trained as a quantitative biologist, he has lectured extensively in the United States and abroad and has published 30 scientific papers.

## EDUCATION:

- Ph.D., Evolutionary Biology, University of Kansas, 1974
- B.A., Biology, California State University, 1969

## CONTINUING EDUCATION:

- IF201 Problem-Solving with the Instream-Flow Incremental Method, 1990 - USFWS
- HEP 150, Habitat Evaluation Procedures, 1989—U.S. Fish and Wildlife Service
- Trout Stream Habitat Improvement Workshop, 1983—University of Wisconsin
- Remote Sensing Technologies Workshop, 1983—University of Kansas

**JOHN J.  
PIZZIMENTI, PH.D.**

**POSITION IN FIRM:** Partner and Managing Scientist

**TOTAL YEARS OF EXPERIENCE:** 28

## RELEVANT PROJECT EXPERIENCE

### Snake River Feasibility Study, WA

US Corps of Engineers, Walla Walla District

ESA — Fall Chinook, Spring Chinook, Steelhead

As Project Manager, led a team to evaluate alternatives to improve fish passage across eight Columbia/Snake River dams. As part of Lower Snake River Feasibility Study for the Corps of Engineers, presented finding to USACE/NWPPC. (See Civil Engineering, 1994 Attachment).

### Snake Reservoir Drawdown, WA

Bonneville Power Administration

ESA - fall Chinook, Spring Chinook, Steelhead

Managed and directed third-party review of the US Army Corps of Engineers \$5 billion design modifications to four Lower Snake River dams and John Day dam to improve fish passage. Reviewed engineering feasibility, cost estimates, biological prudence and environmental and economic impacts. Developed alternative concepts for fish passage. Developed \$2 billion in cost savings.

### Columbia-Snake River Flow Targets

Various Water User Associations

As co-author, prepared white paper addressing biological criteria and power dam flow operations to recover endangered salmon in the Snake and Columbia Rivers. Prepared technical review on NMFS 1998 Biological Opinion for newly listed steelhead stocks. Presented findings to NMFS.

### ESA Recovery Negotiations

Bonneville Power Administration

As Technical Advisor on negotiations between the BPA and state, federal, and tribal agencies, and NGO's on restoration of salmon, provided technical information and review of all issues related to hydropower, economics and fish (1995-1999). Participants: NMFS, WDF, NRDC, Sierra Club, American Rivers, Save our Salmon, and Treaty Tribes.

### Clark Fork Fish Transport Plan

Avista Corp.

Project Manager to prepare a fish transport plan for up/and down stream for endangered fish (Bull Trout) across two high hydroelectric power dams in the Clark Fork River in Idaho and Montana.

### Milltown Dam Fish Passage

PP&L Montana

Project Manager to evaluate feasibility and preliminary designs for upstream passage facilities at Milltown Dam, Montana. Project included four concepts, layouts and preliminary costs to selectively pass up to 13 species of native fish.

### Yacyreta and Corpus Projects,

Argentina/Paraguay

Entidio Binacimas Yacyreta

Prepared a state-of-the-art evaluation of fish passage technologies and gas abatement methods to protect endangered species across this 2700 Mw Hydroelectric Project.

### COA Environmental Assessment CDA

Tribe/Bonneville Power Administration (1999-2000)

As Project Manager reviewed and provided quality control for BPA NEPA project for the Coeur d'Alene tribal trout hatchery EA. Responsible for agency consultation, contract negotiation and budgeting.

### BPA/NEPA Analysis (1999)

As Project Manager reviewed and provided quality control for BPA NEPA project of construction activities associated with renovation of the Methow River Irrigation District. Impact assessment on threatened, endangered, or candidate species.

### FERC licensing Experience

Miscellaneous Clients

As Project Manager/Lead Scientist, helped prepare new FERC license applications and supporting environmental, safety, economic studies for 35 hydroelectric facilities in ten states (1981-1999).

*Representatives of fish and wildlife interests and of the hydroelectric industry have spent millions of dollars and words arguing with each other. 'Can better data and new technologies make it possible for fish and hydro facilities to share the nation's rivers?'*

The need is for solutions that work at reasonable prices. The idea is always that you have to sacrifice the environment or the hydro industry. But answers are not necessarily either/or," says John Pizzimenti, managing scientist with Harza Northwest, Portland, Ore., lamenting the sometimes "highly polarized" environment in which past decisions balancing protection of fish populations and energy generation have been made.

It doesn't seem likely that the situation will become less polarized any time soon. The stakes are too high, the contending interests too various, the issues too complex. Hydroelectric power accounts for about 1% of U.S. electric supply and virtually all the nation's renewable energy capacity. According to the National Hydropower Association (NHA), a Washington, D.C.-based industry group, taking hydro out of the energy mix and replacing it with fossil fuels would mean taking 49 million more cars off the road to meet carbon-emissions-reduction goals in President Clinton's Climate Change Action Plan. Yet hydro is under increasing attack on environmental grounds, mostly for impacts on fish populations. Also at stake are sport and commercial fishing industries, valued at \$200 million annually on the Columbia River alone, with salmon runs a fraction of their historic high of 16 million.

The U.S. Army Corps of Engineers operates eight of nine dams on the Columbia and Snake rivers in the Pacific Northwest that produce about 10,000 MW of power. (The Bureau of Reclamation operates the ninth, the Grand Coulee Dam). The 1992 listing of sockeye salmon as endangered and three other stocks of chinook salmon (spring, summer and fall) as endangered has intensified a long-running battle over restoring fish runs and sent mitigation costs skyrocketing. The local Bonneville Power Administration, which markets power produced at the dams, claims that its annual costs for fish protection have jumped by \$200 million, from \$145 million to \$350 million, in the past three years. With stocks of returning adult salmon

nevertheless continuing to decline, some fisheries advocates are pushing for a plan to draw down Snake River reservoirs and increase spring-summer water flows. This is supposed to speed downstream migration of juvenile fish, improving their chances of surviving the journey to the sea.

Elsewhere, relicensings of nonfederal hydroelectric dams by the Federal Energy Regulatory Commission (FERC) have brought similar battles to river systems across the country. When the plants were originally licensed 50 years ago, fish and wildlife protection received scant attention compared to economical power generation. Environmentalists are looking to make up for that past neglect, states are asserting their rights to control use of their water resources, and hydro operators are protesting that fish passage and protection requirements—and the time and expense of the relicensing process itself—are threatening their economic survival. Further complicating the regulatory picture, a Supreme Court decision this spring appears to allow states to set minimum flows at hydroelectric facilities under the authority of the Clean Water Act (see sidebar).

#### COLUMBIA RIVER DRAWDOWN

The proposed drawdown of Snake River reservoirs to improve downstream salmon migration are a good example of a case in which political passions rather than objective science have driven the debate, according to Pizzimenti. Most downstream migration is currently by barge, in a program the Corps' Walla Walla (Wash.) District has operated since 1977. Despite increasing numbers of barged fish—about 15 million were transported in 1993—fewer adults have been returning each year. Opponents of the program, such as the Idaho Department of Fish and Game, blame stresses and diseases caused by barging, but the Corps points to other possible factors, such as ocean fishing, potential weather influences and upstream fishing by Native American tribes.

Earlier this year, Harza Northwest submitted its final report to the Northwest Power Planning Council, a regional group, on the feasibility of various drawdown schemes under consideration by the Corps

of Engineers. The most radical, known as the Natural River option, would involve complete 100 ft drawdown of four Snake River reservoirs (Lower Granite, Little Goose, Lower Monumental and Ice Harbor) plus partial drawdown of John Day dam. Capital costs to reconfigure the dams and drawdown would cost \$5.1 billion, in addition to costs of lost power generation, and the work would take at least a decade to complete. The result: Salmon runs, currently 10,000–20,000 for spring chinook and 1,000–2,000 for fall chinook, could double—maybe.

That judgment is based on regional fish population models, which "are not perfect and are continually under revision as new survival and adult return data are calibrated each year." Both the Natural River option and a less drastic alternative, an \$86 million plan to draw down Lower Granite reservoir (which, however, would bring only minor potential improvements in river flows), are feasible from an engineering standpoint the report noted, but "the problem is deciding what economic cost the region is willing to accept for unproved and uncertain anadromous fish benefits."

Harza examined the two options and reached some "fairly startling" conclusions, says Pizzimenti. For one thing, analysis of adult returns of Snake River fish from 1988 to 1991 showed that in-river migrating fish may have actually outperformed transported fish for the 1989 out-migration. This offers some support for the view that "fish belong in the river," he says. If so, modifying the existing system could be enough to stabilize and even enhance the existing salmon populations. Harza recommended further testing to compare downstream passage, survival and adult returns of in-river migrating and transported fish and to determine more exactly the sources of juvenile mortality and migratory delay to focus mitigation efforts better.

The Harza report also recommended use of a surface collection and bypass system, already in use at another Columbia River facility, Wells Dam, built in 1968. The report estimated that such a system could potentially bypass 90% of migrating juveniles (compared to 60% efficiency for screen systems that force fish to sound 60

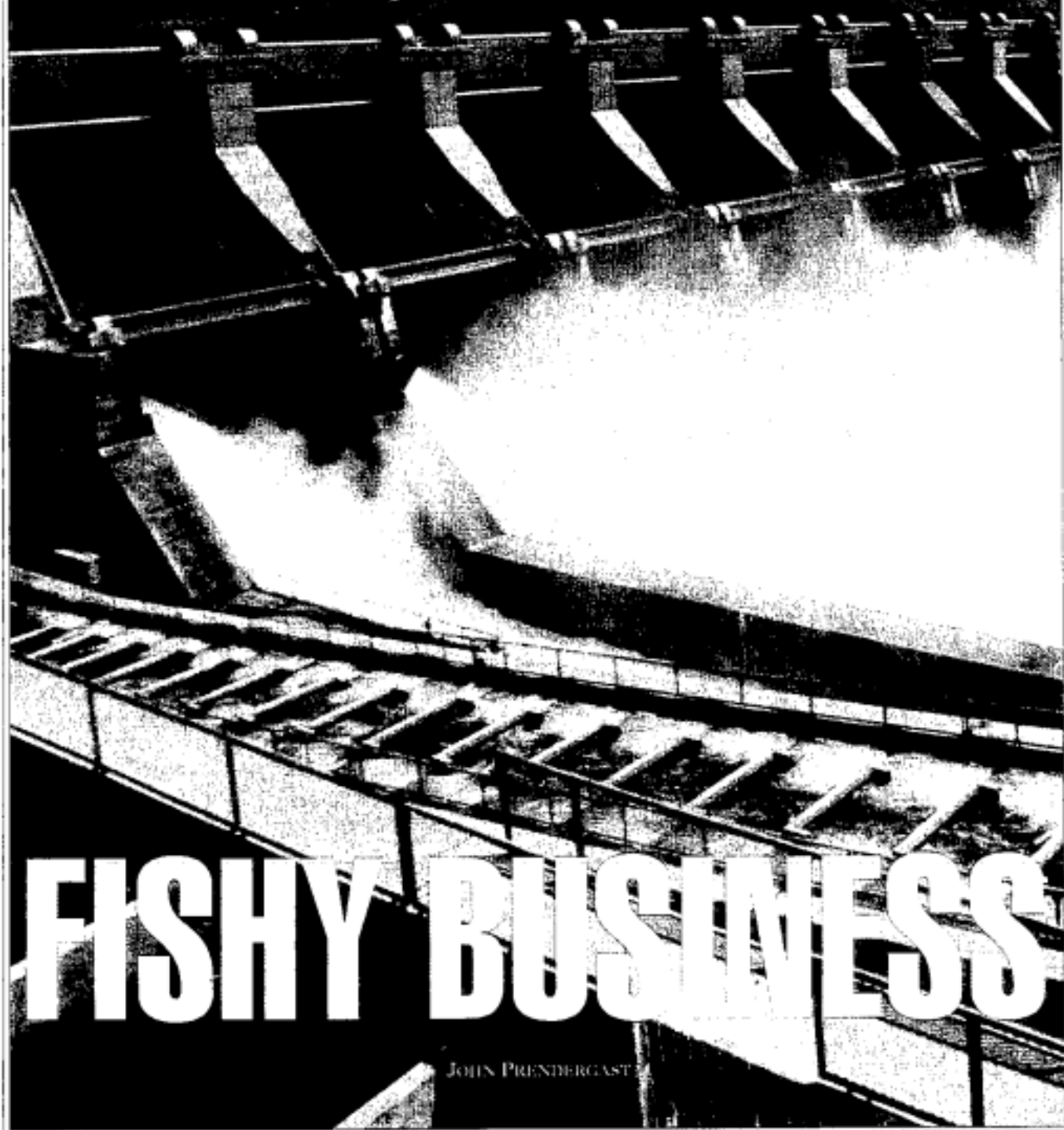
**A PROPOSAL TO SPEED DOWNSTREAM MIGRATION OF SALMON CALLS FOR DRAWING DOWN RESERVOIRS AT JOHN DAY AND FOUR OTHER DAMS ON THE SNAKE RIVER IN THE PACIFIC NORTHWEST.**

ENGINEERED  
DESIGN AND  
CONSTRUCTION  
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NOVEMBER 1994

ENGINEERING



# FISHY BUSINESS

JOHN PRENDERGAST

# DANA E. POSTLEWAIT, P.E.

Civil / Fisheries Engineer

Years of experience: 15

## QUALIFICATIONS

**Mr.** Postlewait specializes in the planning and design of fisheries projects, including fish passage and production facilities, and habitat projects. **As** a senior civil engineer with 16 years of consulting experience, he has worked on a number of fisheries, site development, water control and roadway projects for public, private, and Tribal clients. His roles have ranged from project manager to design engineer on jobs spanning the entire project cycle from planning, site selection and preliminary design to the preparation of contract plans, specifications, and construction cost estimates. Following the design phase, Mr. Postlewait has also held lead roles in the construction management, inspection and monitoring phases of these civil works projects. Mr. Postlewait's design skills encompass many aspects of fisheries and civil engineering including: development and evaluation of fisheries design criteria, agency coordination and negotiation, permitting, FERC licensing, water supply and wastewater handling, earthwork, civil, and site design, topographic surveying and mapping, hydrologic studies, stormwater control, utility work, and structural analysis for concrete and steel.

### Education

- B.S., Civil Engineering,  
University of Washington, 1984

### Continuing Education

- Fish Screen Workshop, 1998
- Certified Value Engineering 40-hour Workshop, 1989
- Fish Passageways and Diversion Facilities Short Course, US Fish & Wildlife Service Fisheries Academy, March 1988

### Professional Registration

- Washington



## EXPERIENCE

### Hofer Dam Fish Passage, WA

Bonneville Power Administration

Project manager providing contract administration, agency consultation, and technical oversight for the retrofitting of an early 1900's vintage irrigation diversion to accommodate modern fish passage criteria. Due to recent listings of endangered species, the Bonneville Power Administration is administering funding to improve several irrigation diversions in the Walla Walla basin. Harza's services include planning studies and agency coordination for construction of a modern fish screen for the 40 cfs diversion, and to retrofit the dam for upstream passage. Harza is also under contract to complete final design, select a construction contractor, and to administer the construction contract of the facility improvements.

### Garden City / Lowden 2 Intake Consolidation and Fish Passage Project, WA

Bonneville Power Administration

Project manager providing contract administration, agency consultation, and technical oversight to improve fish passage conditions for bull trout, spring chinook, and steelhead at two irrigation diversions in the Walla Walla basin. Rather than modify and construct upstream passage modifications and screens for two gravity intake diversions, Harza has been tasked with consolidating the two antiquated diversions into one modern diversion that will provide 50 cfs of irrigation flow. Preliminary and final design of a new permanent

diversion structure and modern fish screen are key to this assignment. Additionally, design of a new canal, and increased capacity for existing irrigation laterals are part of this project. Current plans call for construction in the summer of 2000.

### Lake Cle Elum Fish Passage Study, WA

U.S. Bureau of Reclamation

Due to recent Endangered Species Act listing of spring chinook and bull trout, the Bureau has contracted with Harza to provide an initial review of alternatives to provide upstream and downstream fish passage for their flood control and irrigation project on the Cle Elum River. Mr. Postlewait is responsible for oversight and senior review of the planning study.

### Industrial Intake Study, WA

Economic and Engineering Services, Inc. for Confidential Client

Project manager and lead engineer to develop a planning report identifying alternatives and costs to update a 145 cfs municipal water supply surface water intake with outdated vertical traveling screens to meet current fisheries criteria.

### Columbia River Basin Fish and Wildlife Project Capital Cost Review, OR, ID, WA

Bonneville Power Administration

Mr. Postlewait is currently project manager assisting the BPA in developing protocol to better estimate and monitor cost and schedule compliance for all BPA funded fish and wildlife projects. Projects typically involve fish passage, fish production, and habitat improvement. This work will feed into the project

selection and prioritizing of BPA's annual \$27 million capital project budget for the fish and wildlife program. This project is the next phase in preliminary work Harza performed in 1997, which was the basis for this year's 3-step process implemented by the Northwest Power Planning Council, and Columbia Basin Fish and Wildlife Authority for FY 1999.

### Cowlitz Complex Hatchery Study, WA

City of Tacoma

Supervisory engineer to conduct a comprehensive hatchery complex evaluation study in support of FERC relicensing for the Cowlitz Mossyrock and Mayfield Hydroelectric Projects. Facility alternatives along with biological production goals and opportunities were examined and quantified to help plan the future direction for the Cowlitz Salmon and Trout Hatcheries. The next phase of this project will develop conceptual designs for major facility upgrades to accommodate the biological goals.

### Cowlitz Project Fish Passage Study, WA

City of Tacoma

Senior review and advisor role to Harza engineering and biologist team responsible for identifying upstream and downstream fish passage facility alternatives in support of relicensing activities for the Cowlitz Mossyrock and Mayfield Hydroelectric Projects. A conceptual design report including functional design drawings and descriptive text was prepared for agency and public review.

## QUALIFICATIONS

Dr. Priestley has more than 20 years of experience in planning and project assessment. He is nationally known for expertise in evaluation of aesthetic, land use, property value, and public acceptance issues associated with infrastructure facilities. His experience includes assessment of land use and visual effects of proposed projects; studies of public perceptions of existing facilities; and projection of community land use development trends. He has academic training in environmental planning theory and methods, and experience in designing and conducting studies that apply these ideas and methods to assess environmental planning and policy issues.

Dr. Priestley has experience with projects involving resource management issues on US Forest System lands, and in working with US Forest Service staff, USFS resource analysis systems, and with the provisions of Forest Land and Resource Management Plans.

He is skilled in developing work programs and budgets, assembling and managing interdisciplinary project teams, working with stakeholders, providing quality control for products, and integrating study findings into readable documents useful for decision-makers. Dr. Priestley has also had experience as a meeting facilitator, and his project work has included structuring and facilitation of advisory group meetings.

### Education

- Ph.D., Environmental Planning, University of California, Berkeley
- MLA, Environmental Planning University of California, Berkeley
- MCP, City and Regional Planning, University of California, Berkeley
- BUP, Urban Planning, University of Illinois, Urbana

### languages

- French

Environmental Planner

Years with firm: 1

Total years of experience: 24

## SELECTED EXPERIENCE

### International Electric Transmission Perception Project

Project manager for a multi-year research program sponsored by Hydro-Québec, Électricité de France, BC Hydro, the Bonneville Power Administration and Southern California Edison. Managed a team of planners and social scientists conducting research aimed at development and application of standardized methods for surveying the public's perceptions of the impacts of high voltage transmission lines. Identified transmission line siting issues and information needs, summarized and evaluated existing research findings, participated in development of a conceptual framework for understanding the public's perceptions, and contributed to development of a master plan and design for preparation and testing of standardized survey instruments.

### Plum Creek Land Exchange EIS, Mount ~~de~~ Snoqualmie, Wenatchee, and Gifford Pinchot National Forests, Washington

Analyzed land status and use, aesthetic, recreation, unroaded area, and wild and scenic river issues associated with the proposed exchange of over 100,000 acres of forest land between the Plum Creek Timber Company and the National Forest system. Assessed public and agency concerns; developed an analysis strategy; used Forest Service GIS data as the basis for map and statistical analysis; collected and made use of supplemental data generated through field work, interviews, and review of published sources; and prepared analyses and summary text for the EIS.

### Plum Creek Road Access EIS, Wenatchee National Forest, Washington

Analyzed aesthetic, recreation, unroaded area, and wild and scenic river issues associated with the proposed development of over 40 road segments over U.S. Forest System lands to provide access to future timber harvest areas on adjacent Plum Creek Timber Company parcels. Assessed public and agency concerns; developed an analysis strategy; used Forest Service GIS data as the basis for map and statistical analysis; collected and made use of supplemental data generated through field work, interviews, and review of published sources, and prepared analyses and summary text for the project EIS.

### Environmental Evaluation of Proposed Modifications to Existing Hydroelectric Facilities

On behalf of Hydro-Québec, documented FERC procedures and guidelines for environmental assessment of changes proposed for existing hydroelectric projects. Documented hydro upgrade-related activities undertaken by the US Bureau of Reclamation and the US Army Corps of Engineers. Collected procedures, guidelines and examples of project environmental assessments and post-construction monitoring studies prepared by or for these agencies.

### Ramsey-French Meadow Hydro Project. FERC Initial Scoping, Stanislaus National Forest. California

Scoped the visual issues associated with a hydroelectric project proposed by the Northern California Power Authority for the North Fork of the Stanislaus River. Coordinated with Forest Service landscape personnel, reviewed Forest Service and county plans, conducted field evaluations of landscape conditions, prepared the visual effects section of the Initial Scoping Document, and prepared a plan for the assessment of the aesthetic issues.

### Shoshone Falls Hydroelectric Project, Aesthetic and Site Enhancement Studies, Idaho

Consultant to Idaho Power on the effects of proposed relicensing of the Shoshone Falls hydroelectric project on the aesthetic qualities of the falls and adjacent park. Provided direction for development of the analysis approach for assessing the effects of changes in flows over the falls on the falls' appearance and public expectations. Evaluated the project in light of local government and land management agency plans and policies, analyzed recreation survey data to identify implications for aesthetic issues, designed and implemented perception studies involving focus groups and surveys, worked with an advisory committee of representatives of local governments and state agencies. Based on this process, recommended mitigation and enhancement measures. Assisted in preparing a visual analysis report for incorporation into the Exhibit E submitted to FERC.

### Snoqualmie Falls Hydroelectric Project FERC Exhibit E, Washington

Analyzed the aesthetic implications of a proposal by Puget Sound Power and Light to increase the capacity of its generating plant at Snoqualmie Falls. Assessed impacts of structural changes and changes to flows over the falls. Analyzed recreation survey data to identify implications for visual issues. Developed and applied a methodology for evaluating the effects flow changes would have on the falls' appearance. Prepared the Aesthetics section of Exhibit E of the relicense application. Developed the script for a video on the aesthetic issues prepared for submission to FERC.

### Swan Lake, Lake Tye Transmission Project EIS, Tongass National Forest, Alaska

Prepared the visual section of the EIS for a 60 mile transmission line and associated access roads proposed by Ketchikan Public Utilities for lands on the Tongass National Forest in Alaska's southeast peninsula. Coordinated with Forest Service planning and visual resource management specialists, reviewed Forest Service Visual Resource Management analyses and policies for the project area, analyzed existing landscape conditions, evaluated the aesthetic effects of similar facilities that already exist in the region, provided advice about siting of the route alternatives, analyzed the visual effects of the alternatives, and developed mitigation strategies.

### Growth and Development Studies, Northern and Central California

For Pacific Gas and Electric, designed, scheduled, and managed studies evaluating growth trends and forecasting future development to provide a basis for planning and siting future electric facilities in urban and rural areas throughout Northern and Central California. Supervised work that included coordination with local planning agencies; data gathering and evaluation; analysis of economic, demographic, environmental, infrastructure, and policy data; development of growth projections; and reporting of findings.

## KEY QUALIFICATIONS:

Mr. Steven J. Statz is a fisheries biologist responsible for project management, planning, conducting field studies, analyzing data and preparation of reports.

He has expertise in numerous methods of fisheries and habitat evaluations. He has conducted studies assessing fishery issues and mitigation alternatives at more than 20 hydroelectric facilities throughout the United States. Steve has extensive experience with habitat assessment and stream restoration methodologies.

## EDUCATION:

- Bachelor of Science, Water Resources, University of Wisconsin, 1986

## Professional Societies:

- American Fisheries Society

POSITION I II FIRM: Fisheries Biologist

YEARS ~~VH~~ FIRM: 10

TOTAL YEARS OF EXPERIENCE: 13

## EXPERIENCE RECORD:

### Cowlitz River Project, Washington Tacoma Public Utilities

Designed, conducted, and reported studies to develop mitigation alternatives and an Environmental Assessment of the Cowlitz River Project. Supervised stream habitat surveys, migration barrier surveys and fish population surveys. Surveys were based on protocols presented in the USFS – Region 6 stream survey methodology (1995), Powers and Osborn (1985), and Henkin and Reeves (1988). Designed and conducted radio telemetry studies analyzing release locations effects on fallback and spawning success of coho and late winter steelhead in a salmon reintroduction project. Designed and conducted radio telemetry studies investigating behavior and travel times of emigrating coho, steelhead and chinook smolts in two reservoirs. Conducted salmon redd and intergravel dissolved oxygen surveys.

### Riparian Habitat and Water Quality Assessment, Oregon

City of Portland Bureau of Environmental Services, US Army Corps of Engineers

Mr. Statz is managing this project, which involves the assessment of stream condition and relative quality of fish and wildlife habitat in selected stream reaches and adjacent upland areas in a Willamette tributary and Columbia Slough watersheds. Chemical, physical, and biological samples were collected and interpreted to assess the water quality of Johnson creek and Johnson Creek tributaries.

### Kellogg, Mt. Scott Watershed Assessment, Portland, Oregon

Clackamas County. Water Environment Series

Investigating the Kellogg and Mt. Scott Creek Watersheds to provide Clackamas County with a salmonid limiting factors analysis. The scope of services for this project includes fish passage evaluation, and recommendations for restoration.

### Riparian Habitat and Water Quality Assessments

City of Portland Bureau of Environmental Services. US Army Corps of Engineers

Conducting inventories and assessing the condition and relative quality of fish and wildlife habitat in selected stream reaches and adjacent upland areas in a Willamette River tributary and Columbia Slough watersheds.

### Payette National Forest, Idaho

Payette National forest

Conducted fisheries surveys for threatened and endangered species in Idaho's Payette National Forest. Classified 21.5 miles of streams using a modified Hankin and Reeves classification system.

### Salida Monitoring Plan, Colorado

Public Service Corporation of Colorado

Conducted habitat inventory utilizing the Basin-Wide Stream Habitat Inventory Protocol for the Pike and San Isabel National Forests and Cimarron and Comanche National Grasslands. Analyzed improvements in habitat resulting from increased minimum flows in the South Fork of the Arkansas River.

### Cowlitz Falls Project, Washington

Tacoma Public Utilities

Supervised marking, helicopter and truck stocking of 352,000 coho and 645,000 spring chinook juveniles to rearing areas in the upper Cowlitz River watershed. Assisted in testing guidance efficiencies of a recently constructed bypass facility.

### Columbia River, Washington

Bonneville Power Administration

Provided logistics and training for a radio telemetry study to determine the fate of unaccounted for fall chinook on the Columbia River.

# DANIEL P. TURNER, P.E.

Civil/ Fisheries Engineer

Years of experience: 22

## QUALIFICATIONS

Mr. Turner has worked on many fisheries, site development, roadway and surveying projects. As Project and/or Design Engineer, he has participated in the development of feasibility studies, preliminary engineering, preparation of contract plans, specifications and construction cost estimates for final engineering. Specific areas of fisheries and civil engineering in which Mr. Turner has experience include water supply and distribution, earthwork, roadway design, hydrologic studies, storm and waste water disposal, structural design, site design and topographic surveying. Mr. Turner has also worked as a field engineer, field inspector and survey party chief.

### Education

- B.S., Civil Engineering, University of Washington, 1988
- A.A.S., Surveying Technology, State University of New York, 1977

### Continuing Education

- Fish Passageways and Diversion Structures, USFWS, November, 1993

### Professional Registration

- Registered Professional Engineer: Washington and Oregon

## EXPERIENCE

### Cle Elum Dam — Preliminary Analysis of Fish Passage Concepts

U.S. Bureau of Reclamation

Prepared planning study for the USBR outlining possible scenarios for fish passage at Cle Elum Dam in Washington state. The study included various strategies for upstream ladders and trap and haul systems. Downstream Passage analysis included several possibilities for surface attraction. This particular project was most difficult in that its primary purpose is for irrigation, resulting in yearly reservoir water surface fluctuations of over 100 feet. The study included text descriptions, drawings, and planning level cost estimates.

### Cowlitz Hydroelectric Project- Fish Passage Studies and Hatchery Assessment, WA

Tacoma Power

Mr. Turner was also the Project Engineer responsible for preparation of a fish passage study describing various alternative conceptual designs for passing anadromous fish over Mossyrock and Mayfield Dams. Conceptual designs included passage for both the upstream and downstream migration of various fish species. These studies were used as a basis for relicensing of the Cowlitz Hydroelectric Project in Western Washington for Tacoma Power. He was also responsible for production of an assessment study detailing the operation and condition of the physical facilities at the Cowlitz Trout and Salmon Hatcheries for Tacoma

Power. The analysis concentrated on the major systems necessary for fish production; mainly water supply, water delivery, rearing and incubation. Systems were described by comparing the original design to the actual operation and condition to date.

### Cowlib Hydroelectric Project—FERC licensing Engineering Exhibits

Tacoma Power

Project Engineer responsible for preparing engineering exhibits A, B, C, D, F, G, and H for the draft license application. Duties included coordinating and compiling information on the hydro project with members of Harza and Tacoma Power staff.

### Quilcene National Fish Hatchery Egg Isolation Building

U.S. Fish and Wildlife Service

Project Engineer for Harza on a team of consultants designing an Egg Isolation Building for the ESA listed Hood Canal chum salmon in Washington State. Mr. Turner was responsible for the design of the piping hydraulics, water treatment, and facilities associated with the facilities.

### Powerdale Hydroelectric Project- Fish Passage Facility Conceptual Design, OR

PacifiCorp

Prepared the conceptual design study for PacifiCorp analyzing several fish passage alternatives at the Powerdale Hydroelectric Relicensing Project on the Hood River in north central Oregon. The conceptual designs

presented in the study showed alternative methods for screening downstream migrating anadromous fish that enter the power canal diversion and methods for transport of the unharmed fish back to the river. The report included cost estimates for each of the conceptual designs. Mr. Turner was also the Project Engineer responsible for the design and implementation of a temporary trapping facility in the power canal. The trap was used by Harza fisheries biologists to trap fish without injury in the power canal to enumerate the possible fish loss to the turbines. The trap was also designed not to impact operation of the canal while in use and with the design flexibility to be adapted to other PacifiCorp Hydro projects.

### Mill Creek Fisheries Study, WA City of Kent

Mr. Turner worked with Harza fisheries biologists to complete a fisheries study for the City of Kent. The report studied the condition of anadromous fish runs existing in Mill Creek, an urban stream located in south King County, WA. In the role as Fisheries Engineer, he was responsible for the analysis of existing fish passage facilities and the impact of the facilities on fish passing through the system. Mr. Turner was also responsible for the design of a temporary smolt trap and a permanent smolt counting facility to be used by the City for continued monitoring of the run.



## KEY QUALIFICATIONS:

Mr. Wilson is the GIS Analyst/Coordinator for Harza's Hydropower business unit. He specializes in AML programming, project automation and the implementation of custom menu systems of the ARC/INFO GIS package. He also has experience in platform conversion and database maintenance.

Mr. Wilson has over 14 years of experience in engineering geology, erosion control, and hydrogeology. As a Project Leader, he has been in charge of implementation, coordination, budgeting, technical evaluation, and report preparation on a variety of projects.

Mr. Wilson has been lead geologist on several erosion and sediment control projects at new and existing hydroelectric facilities. On these projects, Mr. Wilson was responsible for identifying erosion and mass movement features, evaluating risks associated with the features and developing remedial measures for minimizing erosion and controlling mass movement.

In southeast Alaska, Mr. Wilson has been involved in assessing karst resource vulnerability in several project areas within the Tongass National Forest. The aim of these studies has been to assess the cumulative effects of timber harvest activities on karst resources.

Mr. Wilson has participated in several studies aimed at developing groundwater supplies. He has implemented numerous field tests to evaluate aquifer characteristics and predict aquifer response to resource utilization. Practical applications of such testing have included well efficiency studies for water supply systems, dewatering studies in support of construction activities and the evaluation of industrial usage on residential wells.

## EDUCATION:

- Bachelor of Science, Geology with emphasis in Hydrogeology, San Diego State University, California, 1986

## CONTINUING EDUCATION:

- Introduction to ARC/INFO;  
Advanced ARC/INFO

## Professional Societies:

- Member, Association of Groundwater Scientists and Engineers
- Member, International Erosion Control Association

## PROFESSIONAL REGISTRATIONS:

- Registered Geologist in Missouri, RG 0592

POSITION IN FIRM: Hydrogeologist / GIS Analyst

YEARS WITH FIRM: 8

TOTAL YEARS OF EXPERIENCE: 14

## EXPERIENCE RECORD:

### Cowlitz Hydroelectric Relicensing Project, Washington, USA

Client: Tacoma Public Utilities

Compiled a database containing information on terrestrial and aquatic habitat, sediment transport, erosion, landuse and cultural resources. Performed queries of the data for resource managers. Developed maps for reports and presentations.

### Powerdale Hydroelectric Relicensing Project, Oregon, USA

Client: PacifiCorp

Compiled a database based on resource personnel field studies containing information on terrestrial and aquatic habitat, landuse and cultural resources. Developed AML programs to perform queries of the data for resource managers. Developed thematic maps for reports and presentations.

### Twin Creek EIS, Alaska, USA

Client: USDA Forest Service - Region 10

Conducted GIS analysis of timber alternatives for 5600-acre project. Developed programs to identify potentially harvestable land based on such factors as ownership, land use designations, timber density, stream proximity and to verify compliance with Tongass Timber Reform Act proportionality requirements.

### City of Chicago Rolling Blackout Analysis, Illinois, U.S.A.

Client: City of Chicago

Provided GIS analysis services for the City of Chicago to assess the impacts on city services and the public from potential utility imposed rolling blackouts. Performed spatial analysis on over 7,300 critical addresses to calculate how many times and for how long each critical address would be affected should a rolling blackout be initiated. Completed a routing analysis to assess Police Department staffing needs to cover critical transportation routes to insure safe traffic flow during blackouts.

### Cushman Hydroelectric Relicensing Project Washington, USA

Client: Tacoma Power

Developed thematic maps to aid resource personnel in their efforts to assess erosion rates and sediment deposition in Lake Cushman. Converted data from AutoCad to ARC/INFO format, digitized and converted resource personnel field data into ARC/INFO coverages, performed overlay analysis to calculate sediment thicknesses and located areas of significant erosion.

### City of Albany Hydroelectric Project Oregon, USA

Client: City of Albany

Lead Geologist for the development of an Erosion and Sediment Control Plan (ESCP) for the construction of a fish screen, diversion dam modifications and canal dredging at the City of Albany Hydroelectric Project. Project included completing a limited geologic survey to identify and map potential erosion hazards at the diversion dam and along ten miles of diversion canal, aerial photograph interpretation geologic research, regulatory liaison and report preparation.

### Condit Hydroelectric Project, Washington, U.S.A.

Client: PacifiCorp

Developed an erosion control plan for the construction of a tailrace barrier at the Condit Power Plant. Project included completing a limited geologic survey to identify and map potential erosion hazards, geologic research, regulatory liaison and report preparation.

### Copper Dam Removal, Oregon, USA

Client: PacifiCorp

Lead geologist for the Copper Dam Removal Project. Developed an erosion control plan which includes measures for control sediment input into the Hood River during a proposed diversion dam, bypass watenway and penstock removals. Identified potential erosion areas and developed identified and selected sites for upland disposal of sediments contained in the impoundment.